DOCUMENT RESUME

ED 143 742 UD 017 305

AUTHOR Cronk, George A., Jr.; And Others
TITLE The New York State Annual Evaluation Report for 1973-74 Fiscal Year.
INSTITUTION New York State Education Dept., Albany. Bureau of Urban and Community Programs Evaluation.
PUB DATE 74
NOTE 135p.

EDRS PRICE MF-$0.83 HC-$7.35 Plus Postage.
DESCRIPTORS *Academic Achievement; *Achievement Gains; Bilingual Education; English (Second Language); Ethnic Groups; Mathematics; *Program Descriptions; Program Effectiveness; *Program Evaluation; Reading; *Urban Areas
IDENTIFIERS *Elementary Secondary Education Act Title I; ESEA Title I; *New York

ABSTRACT

This paper describes and evaluates Elementary and Secondary Education Act Title I Programs in New York State. During fiscal year 1974, 812 projects approved by the State Education Department were conducted in 694 districts. Funds allocated to reading, mathematics, bilingual reading, bilingual mathematics, and English as a second language instruction accounted for 96% of the encumbrances reported. Over 62% of the encumbrances reported were directed at teaching reading in English. Typically, the Title I student was of a minority ethnic origin, resided in an urban area in grades one through three, and was falling further behind in grade level at a rate of one-half year for each grade in reading or mathematics in the absence of supplementary instruction. When the instructional treatments were effective, both public and non-public school pupils achieved at a rate of over a month and one-half for each month of participation in the supplementary services of reading and/or mathematics. Pupils in the effective programs who had been falling further behind ceased falling behind and reduced the distance between themselves and their more advantaged peers. (Author/AM)

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ELEMENTARY AND SECONDARY EDUCATION
ACT OF 1965 - TITLE 1
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FOREWORD

The 1973-74 Annual ESEA, Title I Report conforms to requirements set forth by the U. S. Office of Education by providing for an annual narrative and statistical summary of the ESEA Title I effort in New York State. 1/ Since the central goal of the ESEA Title I Program in New York State was the acceleration of pupil achievement in basic skill areas, the focus of the report concentrates on effectiveness related to academic achievement. Discussions of effectiveness are based upon empirical evidence derived from standardized measurement devices, rather than impressions of processes involved in the planning or implementation of activities.

The major tasks of collating and summarizing the pupil, project, and treatment descriptors were ably handled by David McAnulty, Evaluation Data Manager. Preliminary achievement data collations were performed by Mary Horan and Robert Miller. The report was written by George A. Cronk, Jr.. The assembly of the report was the result of several efforts in unison, most especially those of the staffs of Genevieve Pallone and Charlotte Jewett.

The report was prepared in the Office of Research, Planning, and Evaluation for the Office of ESC Educational Opportunity Programs.

1/ "Annual State Educational Agency Title I Evaluation Report", Instruction #L 212.3, March 27, 1974.

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CHAPTER I: EXECUTIVE SUMMARY

The ESEA, Title I Program is conceived as a Statewide educational effort directed toward reducing academic deficiencies in basic skill areas on the part of educationally disadvantaged learners. During fiscal year 1974 (the 1973-74 school year and the summer that followed), 812 projects approved by the State Education Department were conducted in 694 districts. Of the 516,468 participants receiving supplementary activities, 398,662 English-dominant pupils received instruction in remedial reading, 23,616 other pupils received bilingual reading, 12,069 received instruction in bilingual mathematics, 25,029 bilingual pupils received instruction in English as a Second Language and 193,012 English-dominant pupils received instruction in mathematics. The expenditures of $242,733,371 purchased the full time equivalent services of 10,263 teachers; 1,393 other professionals, 16,556 paraprofessionals and 717 supervisory or administrative personnel for pupils in low income target area schools.

Funds allocated to reading, mathematics, bilingual reading, bilingual mathematics and English as a Second Language instruction accounted for 96 percent of the encumberances reported. Over 62 percent of the encumberances reported were directed at teaching reading (in English).

Typically, the ESEA, Title I student was of a minority ethnic origin, resided in an urban area in grades one through three, and was falling further behind grade level at a rate of one-half year for each grade in reading or mathematics in the absence of supplementary instruction. When the instructional treatments were effective, both public and non-public school pupils achieved at a rate of over a month and one-half for each month of participation in the supplementary services of reading and/or mathematics. In fact, 145,000 pupils in effective diagnostic and prescriptive reading treatments were closing the gap (in the region of accumulated academic deficit), in reference to the achievement of more advantaged pupils at a rate of two-tenths month for each month of instruction. Mathematics participants, about 60,000 in effective program treatments, removed the accumulated deficit at a rate of one-half month for each month of instruction. In other words, pupils who had been falling further behind ceased falling behind and reduced the distance between themselves and their more advantaged peers.

The interpretation of the achievement data was so encouraging that decision makers might be well advised to continue with the policy of concentrating services on selected pupils in the instructional priority areas of basic skills so long as the needs exist.

CHAPTER II: OVERVIEW

During 1973-74, the State of New York expended approximately $242.7 million for ESEA, Title I projects conducted by Local Education Agencies (LEA). The State initiated the effort to meet the educational needs of disadvantaged learners both within the realm of Public Law 89-10 as amended through the Federal and State regulations, and through the priorities assigned by the Board of Regents and leadership in the State Education Agency (SEA). ESEA, Title I money was "targeted" to specific areas of instruction, for specified youngsters with identified needs after identifying specific eligible attendance areas. The expenditures were made to provide instruction to compensate for achievement that did not occur in regular classroom activities funded by tax levy monies. Where students were identified as needing additional help through a needs assessment of economic and educational disadvantagement, Title I projects provided remedial instruction or ancillary services. Where students had reached a learning impasse, because the regular classroom methodology simply did not work, more sophisticated and usually more expensive treatments were designed.

The report describes the nature of the target population by such factors as grade intervals, areas of academic deficiency, ethnic origin, and other demographic considerations. Included also are descriptive statistics addressing the types and numbers of staff, the methods by which students are selected, the degree to which compensatory education teachers and paraprofessionals receive inservice training, and the relationship of ESEA, Title I funded activities with other sources of categorical aid. The larger portion of the report concentrates on pupil achievement in addition to the degree to which program activities, formulated according to approved district proposals, were implemented. The focus of the report is on the degree to which specific cognitively oriented achievement objectives in the basic skill areas of instruction were achieved. Therefore, it is in Chapter VII that the overriding question surrounding compensatory aid is addressed: Is there evidence that educationally disadvantaged learners achieved more growth in basic skills than would have occurred if the ESEA, Title I dollars had not been expended on remedial treatments?

The following definitions of economic and educational disadvantagement are presented so that the position of the Department in setting five goals is clarified.

Disadvantagement

The Federal government established an exact formula for the designation of attendance areas as economically disadvantaged. The State of New York delimited the eligibility of individual pupils with reference to educational disadvantagement.

Economic Disadvantagement. School attendance areas became eligible to contain ESEA Title I services when a "sufficient concentration" of children from low income families was identified in such areas. The determination of a "sufficient concentration" was made by (1) surveying data from the U. S. Census of Population and Housing and/or Aid to Families with Dependent Children (AFDC), (2) computing an average number of children from low income families in each attendance area in the district, (3) computing an average percentage of children from such families in the entire school district and (4) ranking each attendance area according to the percentage and number of children from low income families. Those attendance areas that fell above either districtwide average (percentage or number of disadvantaged) were eligible. All children who normally would be enrolled in an eligible school attendance area qualified for services provided by ESEA, Title I.

Because ESEA, Title I money also followed economically disadvantaged children into the building, children attending private schools, open-enrollment schools, institutions for the handicapped, institutions for the neglected, and institutions for the delinquent brought certain ESEA, Title I services with them.

Educational Disadvantagement. Studies (Coleman, Jencks) of pupils have shown an association between low achievement on norm-referenced tests in reading with low income family status. The State Education Department specified that pupils who were to be served by ESEA, Title I treatments should be certified as "educationally disadvantaged". The criterion for validation of educational disadvantagement in reading was a pupil's score on a norm-referenced test in reading. For example, a pupil in the fourth grade who achieved a reading score of second grade, 1 month (2.1 grade equivalent units) in September was 1 year, 9 months behind the average fourth grade pupil, and thus, educationally disadvantaged. Above grade 3, participants who had demonstrated achievement two or more years behind grade level were the first learners selected for remedial activities.

Educational disadvantagement was the raison d'etre for designing remedial treatments funded by ESEA, Title I. To address the kind and degree of educational disadvantagement, districts were mandated to conduct a needs assessment, to reveal the academic areas for which remedial activities were indicated, as well as the distance from the norm that a target group of educationally disadvantaged pupils was located. New York State, through its annual Pupil Evaluation Program (PEP) statewide testing program in grades 3, 6 and 9, provided each district with an indication by building, of the relative achievement in reading and mathematics that existed. When a large percentage (more than 25 percent) of the pupils in a grade in a particular building scored below the 23rd percentile on either the PEP mathematics or reading tests, such pupils were described as being educationally disadvantaged in a specific subject matter area (e.g., reading, mathematics). The need for a remedial treatment for a pupil generally was established by the pupil's performance on an appropriate norm-referenced achievement test. If ESEA, Title I is to be judged effective in New York State, activities funded by ESEA, Title I should result in a decrease in the educational disadvantagement of learners who were treated according to their established academic needs.

Program Office Goals

The experience of the State with categorical aid programs based upon the New York State evaluation reports of previous years and similar evidence from comparable sister states indicated that ESEA, Title I projects could not be expected to provide all necessary supplementary services for all eligible youngsters given the funding level of the allocations. Since scarcity existed, priorities were established. The following goals reflect the Department's priorities.

Goal #1:

Expenditures of ESEA, Title I monies should be devoted to meeting the needs of disadvantaged learners in reading skills, math skills, and bilingual instruction. In July 1971, the position paper by the State Board of Regents was explicit:

> "The ability to read is absolutely essential to complete fulfillment of human potential in today's increasingly complex society. While deficiencies in any major subject area for example in mathematics, can be crippling factors, the inability to read is deadly. Without this skill the student cannot effectively compete in other areas of scholastic endeavor, much less hope for success in postschool employment and life situations. It is an unquestioned requisite for the good or even the reasonable life, and no child or adult should be denied such capacity." 1/

The ESEA, Title I program office, in the annual priority letter to the Local Education Agencies, reflected the basic skill emphasis:

> "The priorities of Title I, ESEA for fiscal year 1974, are reading, mathematics and bilingual education." 2/

The State, then, through various directive addressing reading, mathematics, and bilingual instruction, clearly stated that ESEA, Title I funded remedial treatments would be focused on basic skill retardation.

1/ READING, the State Education Department, Albany: A Statement of Policy and Proposed Action by the Regents of the University of the State of New York, Position Paper #12, July 1971, page 7.

2/ Letter to City, Village and District Superintendents entitled, "Project Proposals for Fiscal Year 1974, Title I ESEA", Louis J. Pasquini, June 11, 1973, page 2.

Goal #2:

ESEA, Title I funds should be expended on "direct, immediate, personal services to educationally disadvantaged children". 1/ Essentially, the goal means that funds are tied to instructional treatments for identified individuals -- not whole classrooms that happen to be in a target building. Pupils were required to be "identified by name as members of a target population". 2/ Furthermore, pupil personnel service staff employed under Title I projects were directed to "confine their work to this group, regardless of the manifest needs of other pupils". 3/

Goal #3:

The expenditure of supplementary funds should be approximately $400 Per Pupil Expenditure (PPE) during 1973-74. The evaluation report for FY 1971 indicated a tentative trend where treatments were developed, calling for small expenditures of supplementary compensatory money per pupil simply did not bring about significant changes in the academic achievement of the educationally disadvantaged. The goal was to continue to concentrate services on fewer, more severely educationally disadvantaged pupils. The method selected to concentrate services was to specify the per pupil supplement to be spent.

Goal #4:

Districts should have maximum autonomy in designing and implementing remedial treatments to meet individual pupil needs. The local education agency should be the most knowledgeable source concerning the individual needs of each district's educationally disadvantaged population. By being closer to the identified deficiencies than either Washington, D.C., or Albany, N.Y., the district is in the position to tailor the remedial treatment (or learning experience) to the need. While the SEA may be expected to provide technical assistance specific to a treatment, the district is the major behavior engineer in the improvement of the learning process for its own educationally disadvantaged population.

1/ Letter to City, Village and District Superintendents entitled "Program Priorities -- Title I, ESEA Fiscal Year 1973", Louis J. Pasquini, May 15, 1972.

2/ Pasquini, loc. cit., June 11, 1973

3/ Letter to City, Village and District Superintendents entitled "Pupil Personnel Services and the ESEA, Title I and Urban Education Priorities, 1973-74", Irving Ratchick, Leo A. Soucy, August 17, 1973.

Goal #5:

The implementation of a project monitoring force based in regional offices should be operative. In the latter part of the previous year the staff of the five regional offices provided technical assistance that substantially reduced the processing period of application for both State and local officials. During fiscal 1973-74 the regional office staff was directed not only to render technical assistance, but also to monitor project implementation leading to (1) an assurance that the regulations were being adhered to, and (2) more rapid subject matter assistance (curriculum instruction related) where activities were not bringing about the desired outcomes as reflected by a failure to achieve enabling objectives or a breakdown in the delivery system.

Taken as a group, the goals of the Division of Federal Educational Opportunity Programs provided a definite direction for ESEA Title I compensatory aid projects in New York State. Since the New York State Program was only funded at 36 percent of its authorized level, difficult decisions had to be made. Some of the decisions were a direct consequence of the goals. Due to limited funding and other factors, many secondary students and students with other than basic skill needs did not receive service under ESEA, Title I. Economically disadvantaged students achieving on grade level but below potential, did not receive treatments. Other students, equally as eligible as those who receive treatments, were denied treatments due to an effort to contrate resources and services. Consequently, large numbers (thousands) of eligible educationally disadvantaged learners simply did not receive ESEA, Title I funded treatments. While all of the goals did not engender popularity, the results of the treatments described in this report support the wisdom underlying the implementation of policies developed to meet those goals.

CHAPTER III: PROJECT CHARACTERISTICS

While ESEA, Title I funds were allotted by formula to each district, the LEA was permitted to expend its allotment only within the Federal and State guidelines. A proposal to spend monies on remedial treatments was submitted in a structured application to the State Education Department for review. The section below describes the review process, the number of projects conducted during the various school terms, and the priorities set by districts through the reported financial commitment to identified pupil needs.

Review and Approval Processes

A structured application was submitted to the State by each district planning to conduct ESEA Title I-sponsored activities. The Division of Federal Educational Opportunity Programs reviewed each application to determine whether the proposal (1) met district identified educational needs, (2) was consistent with the published guidelines and legal requirements, (3) was compatible with the aforementioned goals, (4) represented a supplementary effort for changing pupil behavior, (5) served eligible target area youngsters, and (6) was accurate and complete in accounting (pupils served, resources earmarked, allowable expenditures by category). In the event a violation of any criteria existed, the Division provided immediate technical assistance to the LEA in an effort to revise the proposal. The Division then transmitted the application to the various subject matter specialty bureaus as well as the evaluation unit for recommendations of action regarding approval. The subject matter specialists reviewed the activities proposed and checked the intent of the proposal (objectives) together with the detailed treatment against the existing body of knowledge associated with previous experience and results in implementing the same or similar treatments. In New York State, ESEA Title I funded activities for the most part were replications of previously implemented treatments that had revealed demonstrated effectiveness. Purely experimental projects were not eligible for funding under ESEA Title I. The evaluation unit reviewed the proposed objectives, the method of data collection, measurement devices, and plan of data analysis. The evaluation unit also reviewed the district's past fiscal year evaluation report to determine the success of the district in meeting previously stated objectives for programs that were resubmitted for funding. The finance unit verified that the proposed expenditure budget was within the law and set up the necessary payment schedules and accounts. The subject matter, evaluation, and financial units recommended follow-up action in terms of approval, modification, or disapproval. If technical assistance was required to reshape the proposal and treatments, the units detailed such changes for transmittal back to the district.

The sections that follow indicate the distribution, by school term, of projects conducted during 1973-74. A financial distribution of district funds allocated by activity category provides information as to the emphasis districts assigned to meeting the disadvantaged learner's needs.

Distribution of Local Education Agencies Participating

There wer 736 school districts operating in the State of New York in the fall of 1973. Of the 736 districts, 720 or 98 percent were eligible for allocations under ESEA, Title I. Six hundred and ninty-four (694) districts of the 720 eligible districts implemented projects. In addition, six Boards of Cooperative Educational Services (BOCES) conducted projects serving 29 districts. Twenty-six (26) districts elected to make a joint effort by pooling resources to conduct 9 projects.

Distribution of ESEA, Title I Projects By School Terms

The districts, which were the chief designers of remedial treatments for disadvantaged learners, implemented 812 Part A, B or C projects during fiscal 1974. 1/ Districts were able to conduct projects for any length of time up to and including 12 months. Projects varied from district to district with respect to the number of hours per week a student was instructed, as well as the number of weeks individual students participated. Summer or yearlong projects whose activities extend through July and August were funded under the allocations authorized for the fiscal year ending June 30, 1973.

Table 1 indicates the distribution of ESEA, Title I Part A, B or C projects by school terms. The largest number (575) was conducted during the regular school terms only.

Table 1

Distribution of Projects Operated
by Session, FY 1973-74

Session	New York City	Upstate	Total
Regular	44	531	575
Summer	29	54	83
Yearlong	1	153	154
Total	74	738	812

While the discussion below deals with a project as the unit, New York City projects were composed of several parts, called "functions", subsummed under one heading. The concept of the term "function" representing a

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1/ Fund sources A, B and C are described in the section on Financial Characteristics of Programs.

project complicates accounting only slightly if the term function is taken to mean project. There were 44 projects conducted during the regular school year, one yearlong project and 29 summer session projects implemented in New York City. Within the 44 New York City regular school year projects there were 286 functions, and within the 29 summer projects there were 83 functions. A single function found within a New York City project frequently was larger than an entire project found upstate. For purposes of aggregating descriptive statistics following this section, each of the 369 functions will be handled as if it were a district project. The discussion of the projects from this point forward will be based upon 738 upstate and 369 New York City projects.

Expenditures by Component

Districts submitted an estimated cost associated with each of the components discussed supra. A survey of the instructional and pupil personnel areas was conducted to determine (1) whether the majority of resources was allocated to direct instruction in the basic skills of reading, mathematics, bilingual education and English as a Second Language, (2) whether the largest part of the resources was directed toward direct instruction as contrasted with pupil personnel services (e.g., guidance, psychological services, social work services, etc.) and other support services (e.g., paraprofessional training, food, etc.), and (3) at which grade interval the sources were directed. In 1971-72, districts in New York "elected to make reading the biggest single instructional item in compensatory projects, but decided to fund instruction in other areas to such a degree that only slightly more than one-third of all instructional resources went to instruction in reading." 1/

Districts reported allocations of almost $129 million for reading components. Approximately $53 million was allocated to mathematics instruction with an additional $14 million to bilingual reading or mathematics instruction and $3.7 million to teaching English as a Second Language. Table 2 displays district allocations across the priority categories, other instructional components, pupil personnel services (PPS), and other services. (Note: Component costs were projections made by districts at the outset of projects prior to amendment and use a different base from the financial accounting system reported in table 4.)

1/ The University of the State of New York the State Education Department, ESEA, Title I Annual Report, 1971-72, page 30.

Table 2

1973-74 District Reported Allocations by Component Category

Grade Level	Reading	Math	Bilingual Reading	Bilingual Math	E.S.L.	P.P.S.	Handi-capped	Others	Total
Pre-K	$ 3,618,030	$ 1,792,788	$ 40,620	$ 15,338	$ 35,566	$ 9,075	$ 7,210	$ 586,627	$ 6,155,254
K	6,882,115	2,488,206	516,368	172,873	278,401	51,708	66,137	221,201	10,677,009
1-3	47,542.618	19,357,130	3,264,474	1,366,623	1,362,808	993,969	1,022,578	986,964	75,897,164
4-6	40,125,321	14,807,844	2,935,326	937,529	1,485,039	1,453,564	449,470	253,075	62,447,168
7-9	19,368,893	7,589,436	2,521,695	992,784	347,620	1,322,764	113,333	146,902	32,403,427
10-12	10,718,794	6,570,887	1,217,758	61,381	154,372	1,332,614	95,496	526,927	20,678,229
Ungraded Handicapped	440,982	290,954	--	--	--	--	109,905	--	841,841
Totals	$128,696,753	$52,897,245	$10,496,241	$3,546,528	$3,713,806	$5,163,694	$1,864,129	$2,721,696	$209,100,092

Approximately $200 million of the $209 million originally budgeted for supplementary services was dedicated to the priority areas set forth in the State guidelines.

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Illustration 1 displays the proportions of resources reported to have been designated for the components summarized in table 2. Components designed to change pupil behavior in reading received 62 percent of the resources discussed here. Funds allocated to reading, mathematics, bilingual reading, bilingual mathematics and English as a Second Language (ESL) components accounted for 96 percent of the reported resources.

Illustration 1

Distribution of Resources to Instructional
and Noninstructional Components

(Base = $209,100,092)

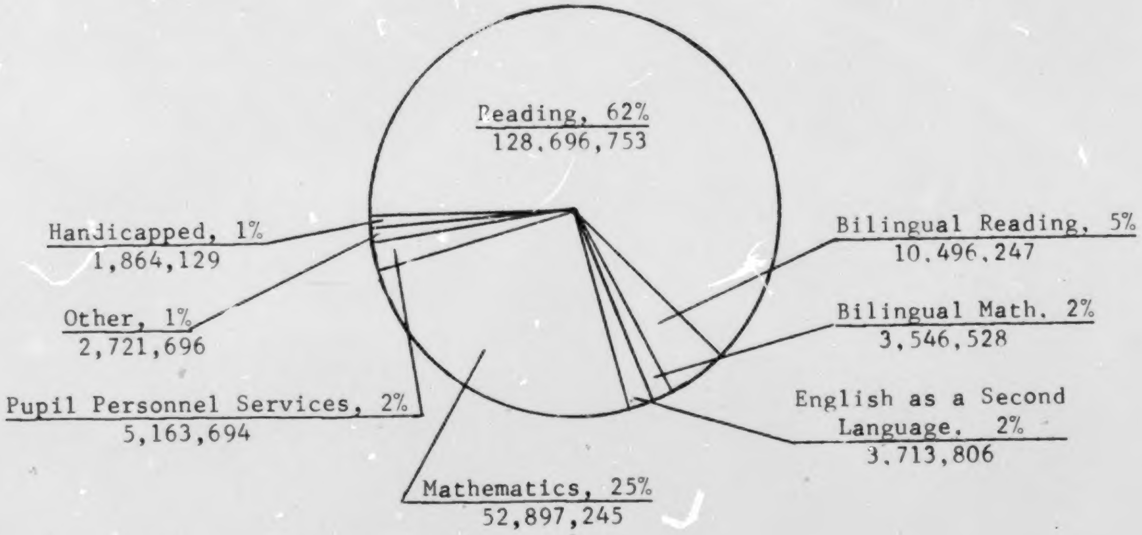
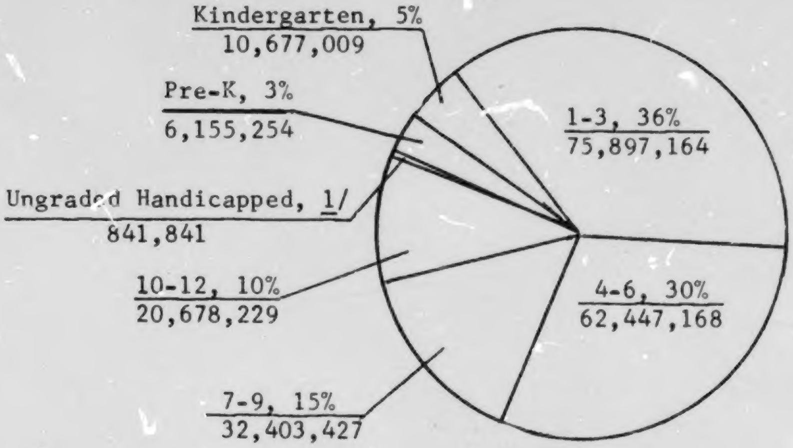


Illustration 2 includes data addressing the grade intervals where resources were allocated. This survey was conducted to determine at which points in pupil development the resources attached to remedial activities were being directed. The data in illustration 2 indicate that grades 1-3 were the most favored target grades for instructional supplements.

Illustration 2

Distribution of Component Resources by Grade Intervals



Nearly three-fourths of the budgeted resources were directed to provide supplementary treatments to pupils in the elementary grades (grade placement under seventh grade).

Financial Characteristics of Programs

Approximately $242.7 million consisting of fiscal year 1973 carryover and 1974 monies was expended. Expenditures as discussed here include disbursements and unliquidated obligations for all costs incurred. Of the $242.7 million expended, 93 percent of the monies encumbered was for Part A: Programs for Children in Low Income Areas. Table 3 displays the expenditures for Parts, A, B (Special Incentive Grants), C (Special Grants for Urban and Rural Schools) as well as the amendment programs serving migrant, certified handicapped and institutionalized delinquent children. Table 4 is a summary of costs across the PL 89-10 programs and amendments. The expenditure categories indicated that salaries for instruction plus employee benefits account for almost 88 percent of the monies. Costs associated with administration, about 5 percent of the expenditures, are subsummed under the expenditure account: "Indirect Cost". Guidance and Attendance Services amounted to less than 3.5 percent of the total expenditures.

1/ Less than 1 percent.

Table 3

Subtotal ESEA, Title I P.L. 89-10
Annual Expenditures for Fiscal Year Ending June 30, 1974

Expenditure Account	Code	Sub Program: Low Income	Percent of Sub Program Total 1/	Sub Program: Special Incentive Grant	Percent of Sub Program Total	Sub Program: Special Grant	Percent of Sub Program Total
Instruction	200	$161,879,407	71.4	$530,574	70.3	$ 672,000	65.9
Staff Development	260	1,504,664	.7	6,956	.9	7,273	.7
Guidance and Attendance	300	7,890,320	3.5	30,094	4.0	57,703	5.7
Health Services	400	322,521	.1	0	.0	0	.0
Pupil Transportation	500	1,630,896	.7	604	.0	3,340	.3
Operation of Plant	600	48,539	.0	414	.0	522	.0
Maintenance of Plant	700	145,570	.0	0	.0	1,551	.1
Employee Benefits	810	37,841,494	16.7	93,403	12.4	145,504	14.3
Rental of Buildings	830	669,740	.3	0	.0	0	.0
Food Services	900	289,221	.0	437	.0	0	.0
Cocurricular Activity	1000	185,541	.0	0	.0	9,350	.9
Community-Home Rel.	1100	688,982	.3	185	.0	15,458	1.5
Indirect Cost	--	11,283,797	5.0	19,935	2.6	35,696	3.5
Minor Remodeling	1220.3	22,264	.0	0	.0	0	.0
Equipment	1230	2,326,575	1.0	72,243	9.6	71,513	7.1
Totals	-	$226,729,531	-	$754,845	-	$1,019,910	-

1/ Rounding error will prevent percentages summing to 100.

Table 3 (Cont'd.)

Subtotal ESEA, Title I P.L. 89-10
Annual Expenditures for Fiscal Year Ending June 30, 1974

Expenditure Account	Code	Sub Program: Low Income	Percent of Sub Program Total 1/	Sub Program: Special Incentive Grant	Percent of Sub Program Total	Sub Program: Special Grant	Percent of Sub Program Total
Instruction	200	$1,434,732	57.5	$ 7,454,690	71.9	$ 957,315	69.7
Staff Development	260	287,628	11.5	128,450	1.2	5,300	.4
Guidance and Attendance	300	47,487	1.9	227,708	2.2	0	.0
Health Services	400	60,139	2.4	78,967	.8	0	.0
Pupil Transportation	500	116,429	4.6	135,616	1.3	0	.0
Operation of Plan	600	15,625	.6	12,906	.1	2,860	.2
Maintenance of Plant	700	4,815	.2	85,901	.8	0	.0
Employee Benefits	810	280,725	11.3	1,492,162	14.4	0	.0
Rental of Buildings	830	4,640	.2	17,916	.2	212,128	15.4
Food Services	900	54,853	2.2	10,734	.1	0	.0
Cocurricular Activity	1000	49,561	2.0	128,943	1.2	16,727	1.2
Community-Home Rel.	1100	29,195	1.2	43,994	.4	30,537	2.3
Indirect Cost	--	65,408	2.6	210,676	2.0	0	.0
Minor Remodeling	1220.3	250	.0	2,830	.0	84,480	6.1
Equipment	1230	43,126	1.7	330,233	3.2	0	.0
						63,399	4.6
Totals	-	$2,494,613	-	$10,361,726	-	$1,372,746	-

1/ Rounding error will prevent percentages summing to 100.

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Table 4

Total ESEA, Title I P.L. 89-10
Annual Expenditures for Fiscal Year Ending June 30, 1974

Expenditure Account	Code	Sub Program Totals	Percent of Sub Program Total
Instruction	200	$172,928,718	71.2
Staff Development	260	1,940,271	.8
Guidance and Attendance	300	8,253,312	3.4
Health Services	400	461,627	.2
Pupil Transportation	500	1,889,745	.8
Operation of Plant	600	78,006	.0
Maintenance of Plant	700	237,837	.1
Employee Benefits	810	40,065,416	16.5
Rental of Buildings	830	692,296	.3
Food Services	900	371,972	.2
Cocurricular Activity	1000	403,932	.2
Community-Home Rel.	1100	777,814	.3
Indirect Cost	--	11,699,992	4.8
Minor Remodeling	1220.3	25,344	.0
Equipment	1230	2,907,089	1.2
Totals	-	$242,733,371	-

Assessment of State Goals Related to Financial Expenditures

The accomplishment of state goals #1, #2 and #3 describe in Chapter II may be tested by comparing the financial expenditures with the goal statement. 1/

The first goal sought to delimit expenditures to meeting the educational needs in the basic skills of reading, mathematics, bilingual reading and mathematics, and English as a Second Language (aural/oral facility). Illustration I revealed that 96 percent of the $209,100,092 from Parts A, B and C were directed at basic skills components. It is concluded that the goal was met.

The second goal sought to direct the expenditures toward direct instruction, rather than ancillary services. The data in table 4 indicated that instruction (salaries plus benefits) consummed about 88 percent of the expenditures. The second goal was concluded as being accomplished.

The third goal set a guideline of approximately $400 per pupil as a recommended expenditure. The combined expenditures for Parts A, B and C divided by the total project count of pupils was nearly $443 per pupil. The goal was inferred has having been met.

1/ Goal #4 (local autonomy) and Goal #5 (regional monitoring) were not expenditure-based and were not tested in this report.

CHAPTER IV: TARGET POPULATION CHARACTERISTICS

Information concerning the population served by ESEA, Title I funds in 1973-74 was gathered from proposal applications and the State Education Department's Mailed Information Report. The data in this chapter describe the ethnic characteristics of the target population and the distribution of participants according to types of components and grade levels in which they were enrolled. Information concerning specific population groups is provided, as well as a discussion of the documented educational disadvantagement of the entire target population.

Methods for the Selection of Participants

Before disadvantaged learners were enrolled as participants in particular remedial treatments, a two step eligibility process was usually instituted. The first step required that a district attendance area meet the "poverty" criteria. The poverty criteria were related to the number or percent of pupils from low income families in the "target building" attendance area. Each pupil within the eligible buildings was eligible for a treatment, based upon the individual pupil's demonstrated academic deficiency. In other words, for a pupil to be enrolled in a remedial treatment, the pupil usually had to attend a target area school and be well below average (age/grade norm) in the subject matter area designated for skill improvement. Given these criteria, the particular pupil may or may not have been economically impoverished, but most certainly was educationally disadvantaged.

Ethnic Distribution

The participation of disadvantaged learners is reported here as a summary across all ESEA, Title I projects. A student participating in more than one project (e.g., one project operating only during the regular school term and another project operating only during the summer) would be counted in each project where he or she received services. Participant data are reported both by number of students expected to receive supplementary services and the number recorded as actually participating. Table 5 includes the participation as reported by ethnic distribution.

Table 5

Participation by Ethnic Origin

Ethnic Origin	New York City		Upstate		Statewide	
	Expected	Participating	Expected	Participating	Expected	Participating
American Indian	191	144	1,110	908	1,301	1,052
Oriental	3,583	2,819	720	631	4,303	3,450
Black	177,568	164,378	58,260	47,686	235,828	212,064
Spanish Surnamed	149,609	140,022	12,753	12,096	162,362	152,118
Other (Including White)	53,126	47,124	109,687	100,660	162,813	147,784
Totals	384,077	354,487	182,530	161,981	566,607	516,468

Illustration 3

Percentage Distribution of Participating Pupils by Ethnic Origin

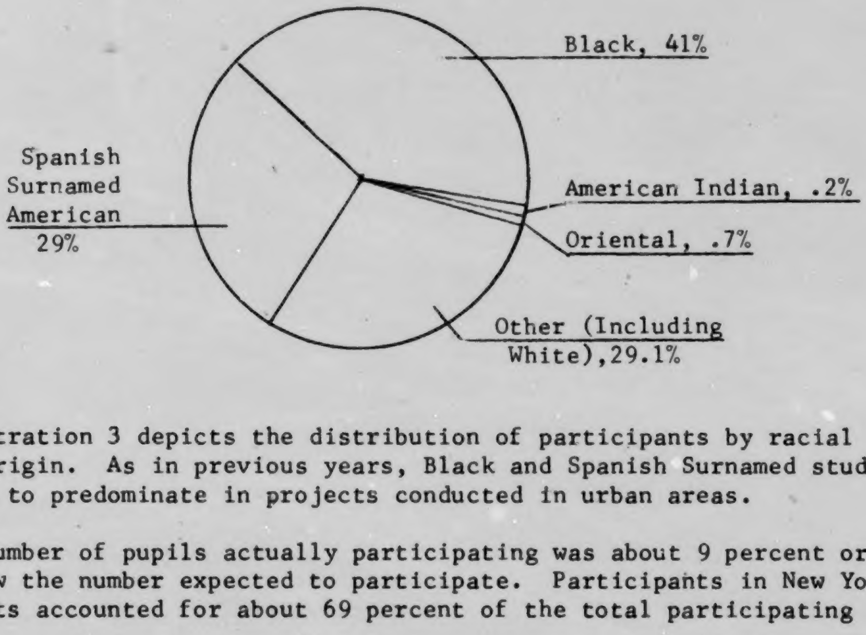


Illustration 3 depicts the distribution of participants by racial or ethnic origin. As in previous years, Black and Spanish Surnamed students tended to predominate in projects conducted in urban areas.

The number of pupils actually participating was about 9 percent or 50,000 below the number expected to participate. Participants in New York City projects accounted for about 69 percent of the total participating population.

Distribution of Component Participation by Grade Level (Duplicated Count)

When considering pupil enrollment figures, it should be taken into consideration that one of the primary goals of the Title I program of recent years has been the diagnosis and remediation of basic skill deficiencies as early in the individual pupil's educational experience as possible. Therefore, enrollment statistics were examined in reference to grade interval distribution. Illustration 4 includes 736,367 component participants, a duplicated count of individuals. However, participation in the early grades, regardless of component, was predominant.

Distribution of Participation According to Type of Component

Each local district submitted information addressing the distribution of pupils according to the specific component in which pupils participated. The pupil data were duplicated in number since a given youngster frequently participated in more than one project and in more than one component within a project. 1/ The component-participation data were reported according to grade intervals (Pre-K, K, 1-3, 4-6, 7-9, 10-12, ungraded and dropouts). Table 6 and illustrations 5, 6, 7 and 8 provide data and graphic representations of the distribution according to component (comparable to the information discussed in Chapter III). The largest percent of the total component participation was enrolled in reading components and the second largest was in mathematics. These findings, shown in illustration 8, were consistent with the State established priorities. These two categories along with bilingual reading, bilingual mathematics and English as a Second Language components accounted for approximately 89 percent of the total component participants receiving Title I services.

1/ Recalling that the project participant count was 516,468 and the component participant count was 736,367, it is estimated that 219,899 pupils or 43 percent of the project participants received at least two treatments (e.g., reading plus one other instructional supplement).

Table 6

Distribution of All Participants by Component And Grade Intervals

(Participant-component count = 736,367)

	Reading		Mathematics		Bilingual Reading		ESL		Bilingual Mathematics		Pupil Personnel Serv.		Handicap Services *		Other Services	
	Public	Non-Public	Public	Non-Public	Public	Non-Public	Public	Non-Public	Public	Non-Public	Public	Non-Public	Public	Non-Public	Public	Non-Public
Pre-Kindg.	10,575	208	6,825	164	196	--	445	--	46	--	106	--	28	--	1,321	--
Kindergarten	17,177	263	7,224	24	857	26	1,152	137	260	12	250	13	252	67	4,681	174
Grades 1-3	128,877	14,346	63,813	5,375	9,486	230	8,562	3,502	4,521	42	2,411	3,225	2,529	3,038	2,074	215
Grades 4-6	118,385	16,447	52,371	8,682	6,628	331	5,376	1,679	3,691	15	2,392	4,159	1,870	2,186	1,717	218
Grades 7-9	56,072	5,374	26,579	2,876	4,379	29	2,679	458	3,128	22	8,979	2,756	416	424	3,252	37
Grades 10-12	27,830	863	17,135	477	1,454	--	990	49	332	--	24,920	437	82	129	8,210	1,197
Handicapped	1,916	--	1,272	--	--	--	--	--	--	--	--	--	177	--	37	--
Dropouts	329	--	195	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	361,161	37,501	175,414	17,598	23,000	616	19,204	5,825	11,978	91	39,058	10,590	5,354	5,844	21,292	1,841
TOTAL	398,662		193,012		23,616		25,029		12,069		49,648		11,198		23,133	

* Parts A, B and C of PL 89-10 Only.

Illustration 4

Component Participation by Grade Interval
(Participant-Component Count = 736,367)

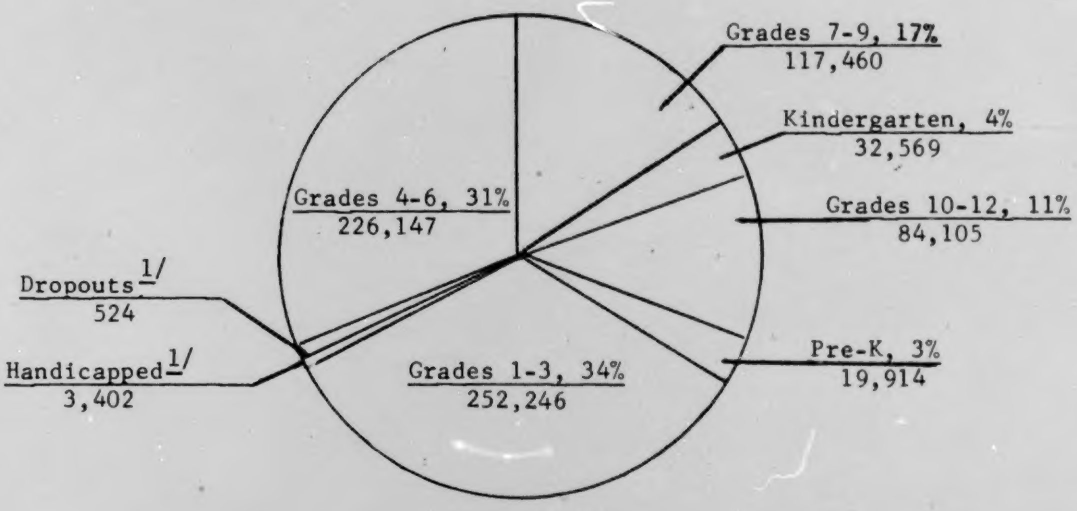
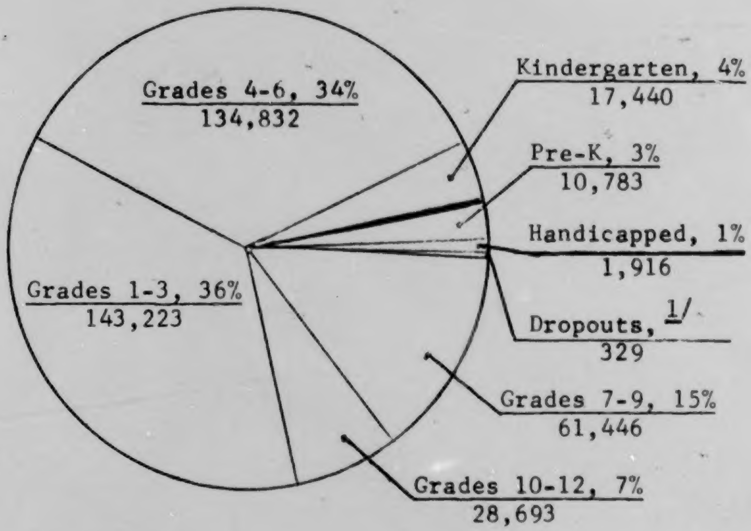


Illustration 5

Distribution of Reading Participants by Grade Interval
(Participant-Component Count = 398,662)



1/ less than .1 percent

Illustration 6

Distribution of Mathematics Participants by Grade Interval
(Participant-Component Count = 193,012)

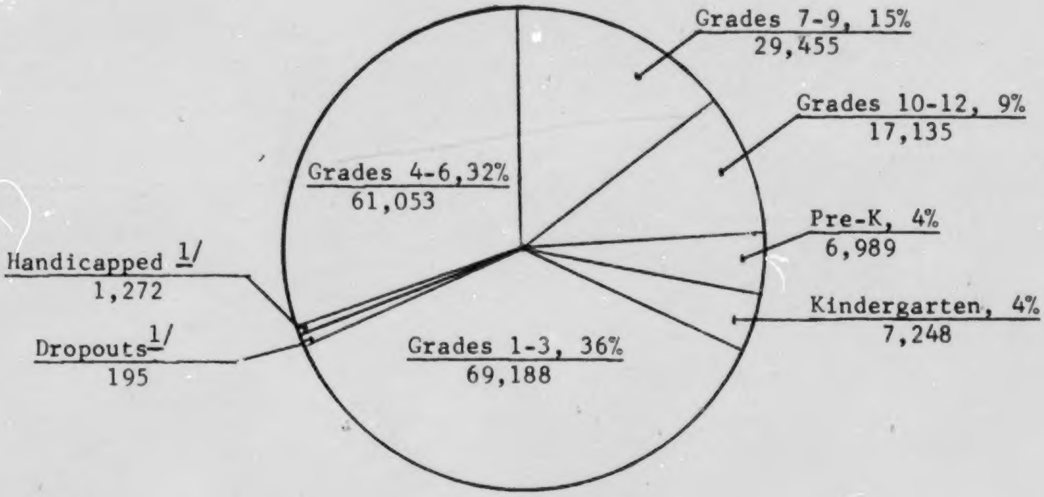
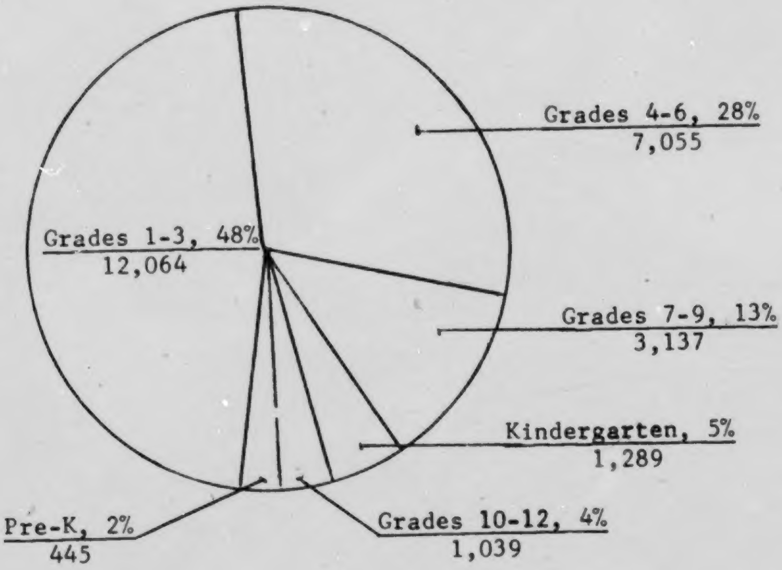


Illustration 7

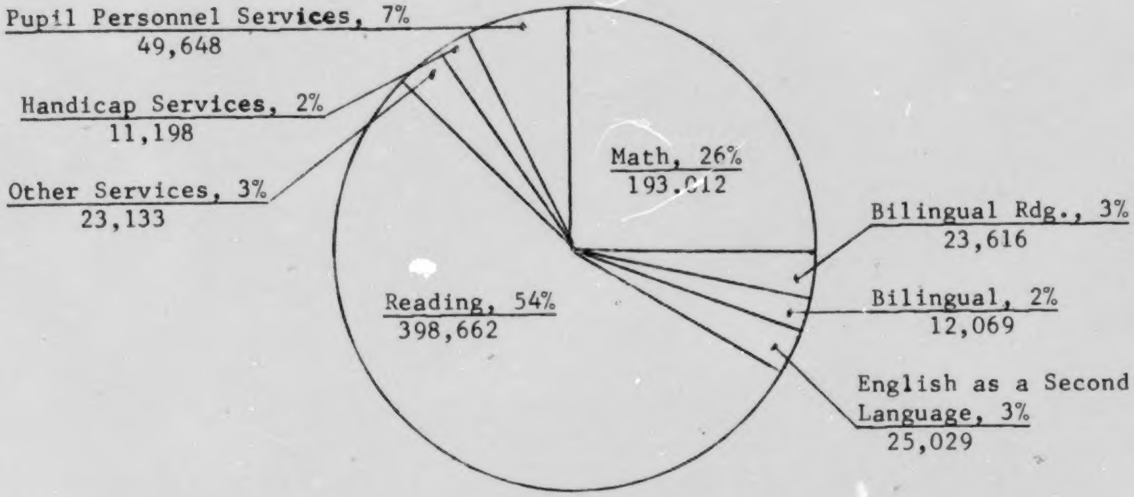
Distribution of English as a Second Language Participants
By Grade Interval
(Component-Participants Count = 25,029)



1/ less than .1 percent

Illustration 8

Component Participation
Total = 736,367



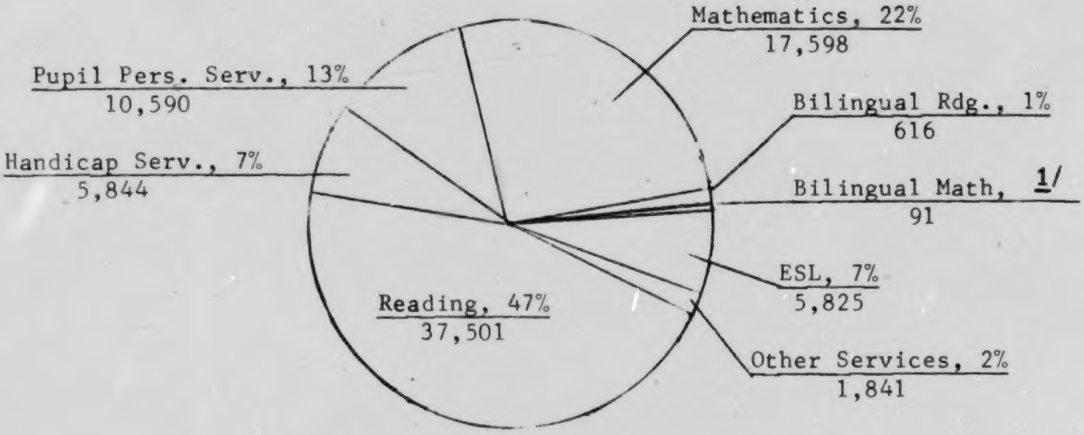
Subpopulations of Interest

Subpopulations of the educationally disadvantaged have been of particular concern to various interest groups in the past. The data below provide a descriptive picture of the magnitude of participation in ESEA, Title I projects by nonpublic school pupils, children of migratory workers, neglected and delinquent youth, as well as certified handicapped children.

Nonpublic school participants. Nonpublic school pupils were reported as having participated in 256 of the 812 projects. An examination of the type of components provided for nonpublic school pupils revealed that reading treatments were the leading supplementary service implemented (as was the case with public school pupils). Table 6 contains a distribution of nonpublic school participants by component. Approximately 77 percent of the 79,906 component participants received services in the priority areas of reading, mathematics, bilingual reading, bilingual mathematics or English as a Second Language, as depicted in illustration 9.

Illustration 9

Nonpublic School Distribution of Component Participants
(N = 79,906)



Neglected and delinquent. 2/ District level personnel provided data concerning the number of children in institutions for the neglected and/or delinquent who participated in district Title I projects. There were sixty projects that specified involvement of neglected and delinquent pupils in P.L. 89-10 supplementary services. The distribution of participants by designation and grade interval is provided in table 7.

1/ Less than .1 percent.

2/ A separate fiscal 1973-74 report devoted entirely to neglected and delinquent participants and the achievement of pupils served by P.L. 89-10 and P.L. 89-750 is available upon request from the State Education Department.

Table 7

Participation by Neglected and Delinquent Children
Fiscal Year 1973-74

Grade Level	Participants			
	Neglected		Delinquent	
	Expected	Actual	Expected	Actual
1. Prekindergarten	19	8	-	-
2. Kindergarten	96	78	-	-
3. Grades 1-3	1,027	1,024	-	-
4. Grades 4-6	1,502	1,471	736	715
5. Grades 7-9	1,973	1,910	1,259	1,215
6. Grades 10-12	1,269	1,208	732	725
7. Ungraded	1,101	1,084	603	539
8. Total	6,987	6,783	3,331	3,194

Children of migratory workers. 1/ A migrant student is defined as the child of any person who has moved across school district boundaries during the school year in pursuit of employment in the agricultural trades. A migrant worker may be one who travels within the State in search of employment, or one who follows the large fruit harvests, often ranging from Florida and Texas to New York State. The district level personnel were asked to provide data concerning the number of children of migratory workers that were included as ESEA, Title I participants. A distribution of migrant students, according to grade interval and in or out-of-State migration, is reported in table 8. The Title I projects that included migrant children were located exclusively in upstate districts. The data provided were for those pupils included in LEA projects under Part A, B or C Programs for Children in Low Income Areas, not the SEA Program for Children of Migratory Workers (P.L. 89-750).

1/ A separate fiscal 1973-74 report devoted entirely to migrant children participants and the achievement served by P.L. 89-10 and P.L. 89-750 is available upon request from the State Education Department.

Table 8

Participation by Children of Migratory Workers

Grade Level	Participants			
	Migrant Instate		Migrant Out of State	
	Expected	Actual	Expected	Actual
1. Prekindergarten	5	4	9	9
2. Kindergarten	32	29	39	41
3. Grades 1-3	104	101	35	36
4. Grades 4-6	86	80	20	13
5. Grades 7-9	38	39	12	6
6. Grades 10-12	27	22	1	3
7. Ungraded	-	-	-	-
8. Total	292	275	116	108

Handicapped. In addition to the expenditures under P.L. 89-313, districts may elect to serve handicapped youngsters 1/ under Parts A, B and C of P.L. 89-10. Pupils with a speech impairment were most frequently provided service, while reading treatments were the serve most frequently offered.

Table 9 includes the distribution of handicapped children by affliction and supplementary service received. As with all component participant counts, each handicapped pupil was counted in each supplementary treatment in which he or she participated.

1/ The definition of handicap requires further work at the Federal level for such categories as "emotionally disturbed", "learning disabled" and "other health impaired". Youngsters with multiple handicaps were reported just once by each district for each component in which service was rendered.

Table 9

Component Distribution of Handicapped Pupils by Affliction

Handicap Treatment	TMR	EMR	Hard of Hearing	Deaf	Speech Impaired	Visually Impaired	Emotionally Disturbed	Crippled	Learning Disturbed	Other Health Impaired	Total
Reading	334	1,520	223	194	1,021	405	4,358	810	2,320	272	11,457
Mathematics	311	1,021	87	109	92	29	2,716	242	1,673	53	6,333
Bilingual Reading	-	10	3	-	1	1	8	1	-	1	25
Bilingual Mathematics	-	-	2	-	-	-	-	-	-	1	3
English as a Second Language	-	-	-	-	-	-	42	-	-	-	42
Pupil Personnel Services	39	190	10	-	69	10	198	9	166	5	696
Other Services 1/	302	668	85	18	6,583	48	512	85	146	114	8,561
Totals:	986	3,409	410	321	7,766	493	7,834	1,147	4,305	446	27,117

1/ Predominately speech related treatments of activities for emotionally disturbed pupils.

Summary of Enrollment

ESEA, Title I supplementary services were provided for pupils of documented educational disadvantagement, about 69 percent of whom were from New York City with reference to total project based count. In urban areas, black and Spanish-surnamed pupils predominated in the remedial efforts in reading and mathematics. Spanish-surnamed pupils constituted nearly all of the bilingual reading, bilingual mathematics, and English as a Second Language component-participants. Participants were most frequently found in elementary grades one through six (65 percent) and in remedial reading treatments (54 percent). A review of the components revealed 80,000 nonpublic school pupils, 10,000 neglected or delinquent pupils, 300 migrant pupils (in Parts A, B and C0, and 30,000 pupils designated as handicapped by an enduring physical or serious psychological affliction.

CHAPTER V: STAFF CHARACTERISTICS

The data below describe the patterns of staff at all levels of treatment implementation. Included are the basic descriptive statistics concerning the professional, paraprofessional and nonprofessional staff which administered, supervised, supported and/or conducted the learning activities that make up the experiences designed to increase pupil achievement.

The data for staffing are discussed in terms of type of staff, (e.g., administrator, teachers, paraprofessional, etc.) and type of service (i.e., direct educative service, in which the staff member was in direct interaction in the project with the students, or support services, in which the staff member was among those who provide ancillary services to the participants). For purposes of comparison, data were compiled separately for New York City and upstate projects.

Statewide Distribution of Staff by Personnel Category

In fiscal year 1973-74, ESEA, Title I funds supported 36,036 positions in local education agencies. Districts reported that number to be equal to 30,644 full-time equivalent employees (FTE). Approximately 70 percent of the FTE or 67 percent of the unduplicated total staff was employed in New York City projects. Approximately 33 percent of the total FTE staff was teachers. Table **10** provides a distribution of staff for New York City and upstate with aggregated statewide totals. New York City districts relied upon paraprofessional staff to deliver supplementary services in far greater proportion to all staff than did upstate districts (35 percent).

Table 10

Statewide Distribution of Staffing by General Personnel Categories, FY 1973-74

Staff Categories	New York City		Upstate		Statewide	
	FTE	Unduplicated	FTE	Unduplicated	FTE	Unduplicated
Administrators and Supervisors	434	555	283	496	717	1,051
Teachers	6,331	7,402	3,932	4,856	10,263	12,258
Other Professionals	689	893	704	965	1,393	1,858
Teacher Assistants (State Certified)	506	515	491	621	997	1,136
Teacher Aides	10,548	11,381	169	196	10,717	11,577
Other Paraprofessionals	2,268	2,700	2,574	3,166	4,842	5,866
Nonprofessionals	588	800	1,127	1,490	1,715	2,290
Totals:	21,364	24,246	9,280	11,790	30,644	36,036

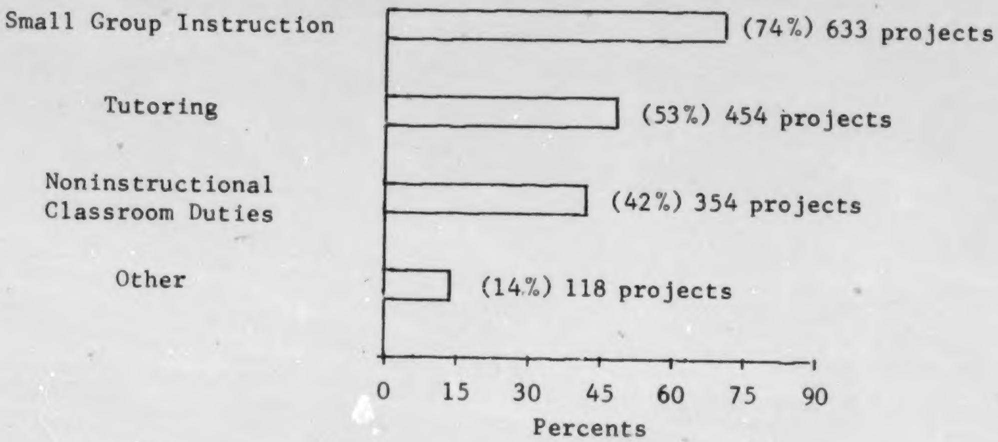
Use of Paraprofessionals

In the previous section, paraprofessionals were recognized as contributing a large part in the overall Title I effort, in both direct instructional and support service capacities. The 15,559 FTE paraprofessionals employed in Title I projects accounted for over one-half (51 percent) of the 30,644) (FTE) statewide staff for FY 1973-74. A survey question, requesting information from each project concerning the capacity in which paraprofessionals were used in the project, was included in the statewide evaluation form.

The employment of paraprofessionals in some capacity was reported in 849 projects. Paraprofessionals were employed in at least two and frequently three different capacities. Illustration 10 provides a bar graph of the categories of paraprofessional use and the number of projects which designated use of paraprofessionals in each category, expressed as a percent of the total number of projects using paraprofessionals (849). Small group instruction was the most frequently designated use of paraprofessionals, followed by tutoring.

Illustration 10

Statewide Distribution of Uses of Paraprofessionals at District Level, by Percent



New York City districts employed 1.7 teacher aides or assitants for each teacher in supplementary activities while districts in upstate New York staffed at a level of .2 teacher aides or assistants for each compensatory teacher.

Direct Educative Services

The staff patterns for Title I projects were further segregated as to Direct Educative Services or Support Services. The distribution of professional, paraprofessional and nonprofessional employees into direct educative services and support services is presented in table 11. Since full time equivalent units reflect positions (albeit that FTE does not take into account the time length difference between yearlong, regular and summer programs), the following discussion and illustrations are based upon comparisons in terms of FTE units rather than unduplicated counts.

The 1973-74 New York City Title I evaluation reports indicated that 19,521 staff members were engaged in direct educative services. Further, 32 percent of the staff were teachers, and 63 percent were teacher aides or other paraprofessionals (classroom paraprofessionals, teacher aides, family or community workers, and other paraprofessionals). In upstate Title I projects, there was a total of 7,493 (FTE) staff members engaged in direct educative services. Fifty-two (52) percent were teachers and 36 percent were teacher aides or other paraprofessionals.

Support Services

Support services are those services which provide administrative, technical and logistical support to facilitate and enhance instruction. Support services involve community services, pupil personnel services including guidance and counseling, testing, health and dental, attendance and food services and other services such as library services, clerical work, evaluation consultatns, transportation, master teachers, AV technicians, etc. For comparison purposes, the data in table 11 are presented separately for New York and upstate, including public and nonpublic school staff, and are always discussed in terms of full-time quivalent units (FTE).

Table 11

Distribution of Staff by Type of Service 1/

Type of Staff	Direct Services			Support Services		
	NYC	Upstate	Statewide	NYC	Upstate	Statewide
Administrators and Supervisors	0	0	0	434	283	717
Teachers	6,331	3,932	10,268	0	0	0
Other Professionals (Specify Below)	406	376	782	283	328	611
Teacher Aides	10,437	169 2/	10,606	111	0	111
Teacher Assistants	506	491	997	0	0	0
Other Paraprofessionals	1,841	2,525	4,366	427	49	476
Nonprofessionals	0	0	0	588	1,127	1,715
Totals:	19,521	7,493	27,014	1,843	1,787	3,630

In FY 1973-74, New York City projects, about nine percent of all FTE staff were employed for support service activities, while upstate projects recorded about 19 percent support services staff.

1/ Full-time equivalent counts.

2/ Some upstate teacher aides included with other paraprofessionals.

Inservice Training by Type

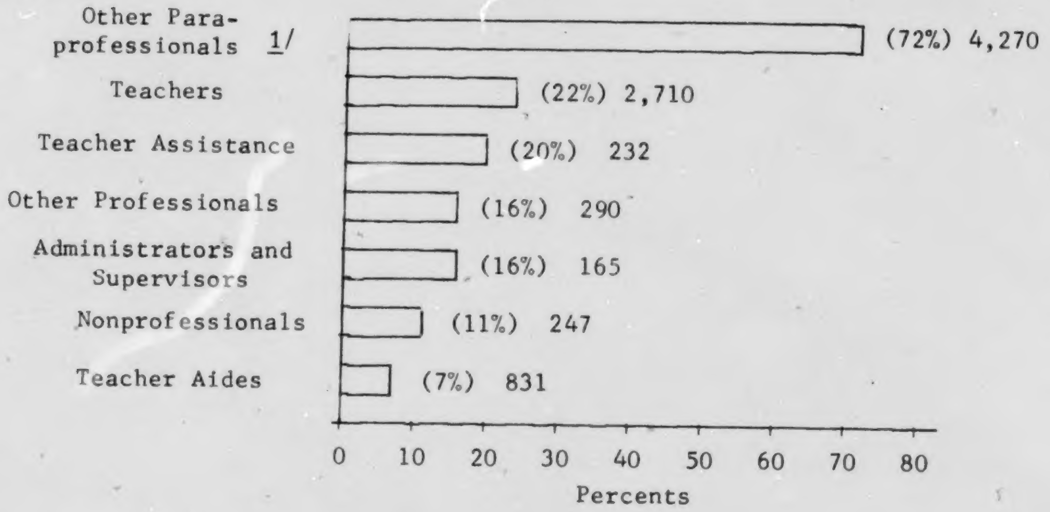
Project personnel were asked to categorize the inservice training implemented for each project in terms of the length of training and the nature of the training. The number of staff who received training was distributed by staff category according to one of four types of inservice activity: (1) Orientation (1 full week or less); (2) Workshops (duration of 1-4 weeks full time instruction); (3) Workshops (duration of 4 or more weeks full time instruction); and (4) College Credit Courses.

The most frequently used inservice training, as revealed in table 12 was the orientation type of training, lasting less than a week. The focus of most orientation sessions was on an attempt to instill a basis of understanding of the psycho-socio-background of the participating students, as well as the elements of the basic skill treatments that would be implemented.

The number of staff receiving training was compared to the total number of staff employed in ESEA, Title I projects. Among the 36,036 staff reported as participating, 8,745 (24 percent) received inservice training. The relation of staff receiving inservice training to total number of staff, by personnel category, is provided in illustration 11. The staff category in which the greatest percent of personnel received training was "other paraprofessional" which included paraprofessionals in classroom support activities, community liaison efforts, etc.

Illustration 11

Percent of Staff Receiving Inservice Training by Personnel Category



1/ Includes Classroom Paraprofessionals.

Table 12

Distribution of Inservice Training

Type of Staff Receiving Training	Training Programs of Less Than One Full-Time Equivalent Week		Workshops				Courses Given for College Credit	
			Duration of 1-4 Full-Time Equivalent Weeks 1/		Duration of 4 or More Full-Time Equivalent Weeks 1/			
	No. Receiving Training	Total Cost	No. Receiving Training	Total Cost	No. Receiving Training	Total Cost	No. Receiving Training	Total Cost
Administrators and Supervisors	146	19,950	18	5,258	1	1,500	0	0
Teachers	2,036	694,270	387	88,550	287	44,430	0	0
Other Professionals (Specify Below)	224	152,044	16	4,000	49	17,904	1	120
Classroom Paraprofessionals (New York City Only)	1,812	108,654	996	349,011	765	125,789	144	69,506
Teacher Aides	526	35,499	237	8,800	68	44,753	0	0
Teacher Assistants (State Certified)	26	985	113	16,125	93	25,148	0	0
Other Paraprofessionals	237	7,998	132	3,099	184	7,869	0	0
Nonprofessionals	219	5,686	0	0	28	828	0	0

1/ May include regular college courses if not taken for credit.

Cost of Inservice Training

The costs of training staff were either (1) wholly paid by district tax levy funds, (2) shared out of tax levy funds, and ESEA, Title I funds, or (3) wholly paid for by ESEA, Title I funds. A total of $1,837,776 of ESEA, Title I funds was reported as encumbered for inservice training. A survey of districts reporting inservice training cost data revealed that the mean cost of providing inservice training was about $210 per staff member trained. The average costs for each category of inservice training paid for by ESEA, Title I in FY 1973-74 are displayed in table 13.

Table 13

Cost of Inservice Training by Type

Type of Inservice	Orientation	Workshop Duration 1-4 Weeks	Workshop Duration 4 Weeks or More	College Credit Courses
Number of Staff Trained	$ 5,226	$ 1,894	$ 1,475	$ 145
Cost of Training	$ 1,025,086	$ 474,843	$ 268,221	$ 69,626
Cost of Training per Staff Member	$ 196	$ 250	182	$ 480

Costs associated with college credit courses and workshops were frequently associated with particular requisites in teaching skills (e.g., for teaching bilingual pupils) or career ladder programs, whereby nonprofessionals indigenous to the communities work and learn with the ultimate goal of professional status and certification.

Among the 30,000 full-time equivalent ESEA supported personnel delivering services directly or indirectly to pupils, about one-third were teachers. New York City relied more heavily upon paraprofessional workers to deliver supplementary service than did upstate districts. Among the 36,000 people implementing Title I projects, nearly one-fourth received some form of inservice training at an estimated cost of $1.8 million.

CHAPTER VI: PROJECT IMPLEMENTATION

The analysis of projects in terms of the degree of attaining objectives is called product evaluation. Chapter VII of this report describes product evaluation through a discussion of increased pupil achievement as measured by norm-referenced standardized tests. In addition to product evaluation, however, ongoing evaluative efforts which address the implementation of services or activities are useful. Such efforts belong to the area called process evaluation.

Efforts to Monitor

Monitoring project implementation in New York State involves the collection of data through site observations and mailed questionnaires for the purpose of determining whether treatments (1) are directed at pupil needs, (2) implemented in conformity with the proposed plan, and (3) may yield the achievement of the objectives of the project.

Needs. Process evaluation involves looking at the participants in light of their needs, potentials, and resistance to change while the treatments or services are being rendered. In an examination of treatments, the on-site observer is permitted to detect possible causes for the failure of proven treatments (previously demonstrated elsewhere as effective) to bring about the anticipated change in behavior. Should a particular treatment be verified through the product evaluation as having failed in bringing about the anticipated change, the process evaluation may illustrate the areas of implementation needing revision. The efforts to monitor projects during operation address several major questions of particular importance for remedial treatments for disadvantaged learners. Answers to such questions assist project administrators to learn from treatment failures.

Some questions are:

1. Was a treatment, previously found to be effective with a similar learning environment, a failure because the treatment was not implemented along the line of proposal? (Failure to deliver learning system).

2. Was a treatment, based upon an eclectic approach of meritorious practices used elsewhere, a failure because the various elements did not integrate in a complementary fashion? (Failure due to untested combinations of applications).

3. Did a treatment, recognized as being effective for selected youngsters for a given duration, fail outright or because of a ceiling effect of pupil output under repeated stimuli? (Failure due to "more of the same" instruction).

Answers to these and other questions are fundamental to the improvement of learning situations provided through categorical aid.

Methods. The State used two procedures to monitor projects. Field visits were conducted by Program Office facilitators and by subject matter specialists throughout the life of projects. A field visit may have been undertaken at the request of the district or at the request of the Division of Federal Educational Opportunity Programs. State subject matter personnel generally gathered information and reported their findings to the district and program office. Some technical assistance, when requested, was provided by the subject matter specialists.

The other major form of monitoring provided by the State employed a Mailed Information Report system. The districts provided relevant data concerning the implementation of the projects during operation and at the conclusion of the project. The three-part form (discussed later) had the additional advantage of collecting comparable data across all districts for reporting results, as well as monitoring ongoing projects.

Field Visits

The SEA program office, in conjunction with other subject matter specialists, conducted a continuous monitoring action with regard to ESEA, Title I projects. Visits by SEA staff include technical assistance in (1) planning for project activities (for resubmission), (2) revising treatments or operations, or (3) assessing processes and verifying the implementation of activities.

Table 14 below presents a distribution of field visits by the thirteen State Support Units submitting reports to the program office. Since the priority areas for instruction were mathematics and reading, plus a concentration of services for bilingual pupils, visits in these areas are reported separately.

Table 14

Distribution of Field Visits for Monitoring Implementation

SEA Personnel	Number of Visits to Districts
Bilingual	8
Mathematics	56
Others	60
Program Office Facilitators	587
Reading	33
Totals	744

Mailed Information Report (MIR) System

Monitoring by mail provided a relatively inexpensive system of project examination by the district. The structured format (mostly closed form) permitted the State to assemble comparable data regarding project enrollment, staff, implementation, and other assessment data for all projects. The form, which was designed to collect data at three points (early implementation, interim, and terminal) during the project life, was comprehensive in that it also served as the district final project report when the three sections plus a narrative description were combined as source data for the State report to the United States Office of Education. Over 96 percent of the requested reports was submitted.

In addition to reporting the basic statistical information (already discussed in earlier chapters), the MIR sought information concerning factors related to (1) delivering the project's proposed services and activities, (2) the coordination of ESEA, Title I sponsored activities with the larger educational enterprise in a district, as well as (3) contrasting elements associated with implementing projects in nonpublic schools with the public schools.

Delivery of services. Questions associated with the delivery of services were framed to elicit responses concerning maintenance of proposed levels of activities, changes in direction of activities, as well as the ability to secure staff and participants in the numbers proposed. Each of these topics was perceived as a common cause of project failure in previously funded projects. An illustration of such questions include the following:

Question: Were any of the original objectives modified after project implementation?

Question: Was the amount of staff adequate for achieving the stated objectives?

Question: Were the services (activities) maintained at the proposed level?

Because the objectives for projects were changed prior to project implementation, and objectives for projects were modified during operation, an assessment of the pupils behavior originally expected (from the porposal) would certainly be in error. Similarly, if projects were felt to be understaffed (or incorrectly staffed), expectations concerning successful attainment of objectives in basic skills must be revised. The evaluation reports indicated that the appropriate facilities were available for 98 percent of the functions implemented. However, with regard to instructional materials, 5 percent of the project reports revealed that insufficient quantities were available at the time they were needed. Such findings, based upon self-reporting (not State auditing), do point to the difficulties of implementing activities in the way proposed.

When the findings for the MIR were analyzed at the first two data collection points, treatment modifications through immediate technical assistance from the State were possible. The MIR forms permitted early reviews of projects sent to the State for refunding in the ensuing fiscal year. The consolidated, closed format of the forms permitted the State to provide comparable data for reporting to the U. S. Office of Education. The data from the form also contributed to the effort toward the isolation of exceptional treatments for dissemination.

CHAPTER VII: ACHIEVEMENT

The three priority areas designated for instruction were reading, mathematics (math), and bilingual education. Reading was primarily remedial in nature while the bilingual education area was subsequently interpreted to consist of 1) oral fluency and aural comprehension in English by speakers of other languages, 2) visual literacy in English reading, and 3) visual literacy in Spanish for Spanish-speaking pupils. Mathematics data obtained from bilingual pupils of limited English-speaking ability are presented separately. The achievement data found below addresses only the pupil performance in the priority areas of instruction.

Each project contained district-prepared behavioral objectives that indicated the area of behavioral change (e.g., reading comprehension), the degree of change anticipated at the conclusion of the treatments (e.g., an increase of nine months in grade equivalent units), and the criterion for reference (e.g., the Metropolitan Achievement reading comprehension subtests). However, superimposed across all projects employing norm-referenced tests, so that comparable data leading to programwide inferences were derived, was the question: Did each treatment group in each priority area demonstrate achievement beyond expectation (based upon the pupils' own past performance) when measured by a norm-referenced achievement test? 1/ So that the district generated information would be in a fashion that permitted aggregation of data across all districts, the local education agencies subjected the pretest scores to a regression equation that estimated where the target population might place at the posttest in the absence of Title I services. A comparison of the obtained posttests was made with the estimated posttests by means of an inferential statistic so that real differences (not differences associated with the standard error of the mean) would be detected. Where the simple method of estimating a posttest mean proved unfeasible (e.g., Prekindergarten Reading Readiness or English as a Second Language) the difference between pretest scores and posttest scores was subjected to inferential analysis. Where appropriate, mastery level tests (criterion-referenced) were administered. The analysis was reported with reference to leveled behavioral objectives achieved. As in the past, district cooperation in this effort proved to be tremendously supportive indicating that districts were analyzing ESEA, Title I data with more scrutiny and sophistication than they usually had done with data which they prepared for local consumption.

An evaluation-related decision made by the State Education Agency (SEA) depressed the impact of the findings reported below. The scores of the 393,000 or so participants discussed in the three priority areas below are tested samples. Generalizations to the total treatment groups

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1/ Some districts translated this question directly into a performance behavioral objective specific to a subject matter area in the local education agency proposal.

have been avoided. Only scores of pupils who had a pretest and a posttest were included in the district-prepared analyses subsequently aggregated by the State. The interpretations of the findings themselves do not permit evaluators to claim that the ESEA, Title I program in New York State was an unqualified success. For example, about 24,000 tested participants' pretest scores in reading or math were so high that they were not designated as eligible for services under ESEA, Title I. Furthermore, approximately 58,000 reading and mathematics participants did no better while participating in ESEA, Title I treatments than they had done prior to Title I intervention. However, the impact of the projects on 245,000 disadvantaged learners leaves little doubt that Title I services positively changed behavior in the basic skill areas on a massive scale.

General Cognitively Oriented Readiness

Districts developed objectives that sought improved pre-reading or pre-mathematics skills for pupils of the prekindergarten and/or kindergarten age span. Measurement devices, developed to assess behavior in the cognitive area for this age span (4-6) often measure reading readiness or mathematics readiness skills simultaneously (e.g., left-to-right perceptions are necessary for following English language print and the initial steps of understanding the number line continuum). The outcome behaviors, therefore, are not discrete to one subject matter area and are reported as general cognitively oriented readiness achievement. 1/

There were several difficulties associated with analyzing the data. Some of the problems were as follows: (1) Since many different measurement devices were used, the data were not always comparable. (2) The devices were administered with various months of treatment in between and did not define an exact length of treatment in months elapsed. (3) Raw scores were the units of measure most frequently used requiring the SEA to make conversions to normalized scores (an opportunity for error). (4) The devices often were mastery related, rather than possessing the accepted standards of item discrimination. (5) Scores of pupil possessing a bilingual background involving limited English language ability in large cities were sometimes averaged with English language dominant participants. (6) In the absence of control groups, reported growth may be a function of maturation effects or other effects not directly attributable to school or ESEA, Title I efforts. (7) Some devices require teacher ratings -- a method that suffers from problems of interrater reliability.

1/ Cognitive readiness is intentionally vague as it applies to prekindergarten and kindergarten skills here. The assumption was made that the several devices sampled equivalent behaviors (content-oriented) albeit in various ways, prior to aggregating the data from several projects.

Kindergarten

Several measurement devices purport to assess cognitive readiness including prereading and premathematics skills. There were group means for 9,179 pupils (among treated groups totaling 9.797 participants) that had been administered the Boehm Test of Basic Concepts, Test of Basic Experiences, Stanford Early School Achievement Test, the Metropolitan Readiness Test, or one of several other less frequently selected devices. Weighted means of several score types from the group pretests and posttests were transformed to the McCall's t score, an area transformation that distributes scores along a normal curve. The aggregated pretest mean t was 38.97 which placed the Title I Kindergarten participants at roughly the 13th percentile prior to treatment. 1/ The posttest mean t was 46.14, a point at approximately the 34th percentile. While the data from the 89 projects that were analyzed here included kindergarten compensatory activities of varying duration, the overall upward movement of the target population toward the 50th percentile or average position of kindergarten pupils was quite encouraging.

English Language Facility

Among the project participants receiving an English as a Second Language (ESL) treatment, treated pupils were assessed for an improved ability to manipulate the sumbols in the English language. 2/ Most ESL, ESEA, Title I participants were Spanish language dominant and were found in New York City. The Oral Language Proficiency Scale (a four-factor scale involving comprehension, structure and syntax, vocabulary, and pronunciation) employing six scalar intervals (from low achievement to high achievement) and leading to a composite score (sum of subtests divided by four), was administered in New York City projects. Alternately, a six-scalar interval device including a "speaking ability rating" and an "understanding of spoken English rating" resulted in a summed composite score for project participants. Two districts elected to administer the Linguistic Capacity Index while the participants in the large nonpublic school ESL component were assessed for growth by means of the auditory (listening) subtest found in the Stanford Achievement Test. Since there were a variety of devices, and because some devices required the use of continuous data and other, discrete data, a concise summary of achievement

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1/ Throughout the data in this report, the phenomenon entitled "regression to the mean" may be operating. The problem, however, is most acute where the selection (for treatment) test and pretest were one and the same. Prekindergarten and kindergarten data were most frequently subject to this phenomenon since no other measures or history of educational deprivation had been established.

2/ In the absence of control groups, the improvement cannot safely be attributed only to ESEA, Title I activities.

in terms of grade equivalent units was not feasible. Consequently, each district was requested to test the difference between means where parametric statistics applied or to select an appropriate nonparametric statistic (usually involving a chi-square distribution) with discrete data. 1/ The application of inferential statistical techniques was implemented to determine whether a true difference existed between the two means or proportions, and the .05 level of confidence was arbitrarily set as the standard.

Data in table 15 reveal public school performance on the New York City Scale of Pupil's Ability to Speak and Understand English except when noted. Long duration treatments refer to ESEA, Title I activities lasting more than three months.

Table 15

Achievement in English Language Facility
Across Long Duration Treatments

District	Treatment Group	Tested Participants	Achieved Objective
-Kindergarten-			
20	45	45	yes
19	30	16	yes
-Grades 1-3-			
24	63	20	yes 2/
19	1,350	429	yes
23 NPS 3/	21	21	no
27	185	185	no
-Grades 4-6-			
19	1,080	291	yes
20	67	67	yes
24	27	19	yes 2/
24	114	26	yes
27	270	264	no
20	32	32	no
-Grades 7-9-			
24	114	76	yes 2/
20	88	88	yes
19	720	167	yes
TOTAL	4,206	1,746	

1/ With paired scores, some districts used statistical tests to determine whether the difference between pretests and posttests varied from zero.

2/ Linguistic Capacity Index.

3/ Nonpublic School Pupils.

An improvement in oral and aural facility was detected for 1,244 of 1,746 tested participants (71 percent). It should be noted, however, that paired scores were available on just 42 percent of the treated participants reported here.

The data shown in table 16 were taken from short duration (less than three months) treatments. No difference in the incidence of failure to achieve the objectives was detected across shorter sessions (usually summer school classes) as in sessions spread out over a longer duration. The headings in table 16 refer to the New York City Decentralized district, the participants treated in the component and those pupils tested. The expression "achieved objectives" may be interpreted to mean that a true difference ($p \leq .05$) was detected between the pretest distribution (behavior) and the posttest distribution.

Table 16

Achievement in English Language Facility Across Short Duration Treatments as Assessed by the New York City Scale of Pupil's Ability to Speak and Understand English (Oral Language Proficiency Scale)

District	Treatment Group	Tested Participants	Achieved Objectives
	-Pre-Kindergarten-		
14	325	192	yes
19	75	62	yes
	-Kindergarten-		
14	105	53	yes
	-Grades 1-3-		
14	570	314	yes
19	66	52	yes
12	151	121	yes
2	84	84	no
23	92	92	no
	-Grades 4-6-		
14	500	281	yes
19	70	57	yes
12	71	56	yes
2	22	12	yes
12	78	63	no
2	106	106	no
23	39	39	no
	-Grades 7-9-		
2	153	153	yes
2	211	211	no
Total	2,718	1,864	

An improvement in oral and aural facility was detected for 1,353 (73 percent) from among the 1,864 tested participants in the short duration ESL treatments.

An additional 2,325 pupils were assessed for growth in recognition of spoken English as measured by the Stanford Achievement Auditory (listening) subtest. The data in table 17 were from long duration (more than three months) treatments sponsored by the Central Board of the City of New York.

Table 17

English as a Second Language Auditory Recognition Achievement

School Type	Pupils Treated	Pupils Tested	Achieved Objectives
	-Grades 1-3-		
Public	29	29	yes
Nonpublic	2,966	1,293	yes
	-Grades 4-6-		
Public	33	29	yes
Nonpublic	1,325	291	yes
	-Grades 7-9-		
Nonpublic	409	31	yes
	-Grades 10-12-		
Nonpublic	33	25	no
TOTAL	4,795	2,328	

Among the 2,328 participants assessed for improved English listening and recognition abilities, the real differences between pretest and posttest total raw score means indicated that the objective was met for activities involving 99 percent of the tested participants. Again, however, the data reported for tested participants were less than 50 percent of those reported as participating.

Overall, nearly 6,000 participants in English as a Second Language treatments demonstrated greater proficiency in oral facility and aural comprehension in the English language at the conclusion of the effort than at the outset of the supplementary activities.

Reading

The State set forth a definition of educational disadvantagement that described ESEA, Title I eligible students as those who scored at or below the twenty-third percentile on a norm-referenced test. Furthermore, those youngsters who were two or more grade equivalent units (years) below grade level or were below the 23rd percentile would preferentially be served first by ESEA, Title I services. In keeping with the educational disadvantagement guideline and by careful scrutiny of the real differences reported by districts on the predicted and obtained posttest means, a two-tiered analysis was conducted across all districts reporting reading achievement data. The data were summarized to indicate the mean rates of gain for pupil groups based upon a pretreatment mean rate of gain in order to identify those groups which: (1) were eligible and achieved growth beyond expectation, (2) were eligible and who failed to achieve growth beyond expectation, (3) were not eligible and who achieved growth beyond expectation, and (4) were not eligible and who also failed to achieve growth at a rate beyond their post rate of gain.

Pupils participating in ESEA, Title I projects received supplementary treatments in remedial reading for varying lengths of time across the school year. Commercial devices were administered before and after the treatments in different districts. So that comparable data could be discussed, all pretest and posttest means for pupils in grades one and above, regardless of test publisher, were transformed, where possible, into grade equivalent units for all districts. Since different time periods elapsed between pretest and posttest administrations, all grade equivalent scores were translated into the target groups' rate of gain per month. To facilitate a comparison of pupil achievement prior to Title I treatment intervention and during the intervention period between testings, rates of gain per month prior to intervention and during treatment were computed. 1/ The pupil's past performance becomes his or her own "matched" control pair performance with this scheme. 2/

Applications of Instrumentation

Reading achievement data were aggregated two different ways depending upon whether a norm-referenced or a criterion-referenced test was employed. Generally, if a remedial activity was to span three months or less, the evaluation by means of a criterion-referenced test was encouraged by the

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1/ This method does not account for pretreatment rate inflation by pupils who participated in prior years of treatment. The impact of the reported treatments is lightly depressed by such participants

2/ Actually, the local education agencies use the rates of gain to predict a posttest mean in the absence of treatment, compare the obtained mean at the end of the treatment, and test the differences via a correlated t-ratio or analysis of variance statistic.

SEA. Eligible and ineligible 1/ public and nonpublic pupil reading achievement data collected on norm-referenced devices for pupils in treatments spanning less than three months are presented in Appendices E and F. About 23,000 pupils met the reading objectives during the reading treatments of short duration as determined by norm referenced measures taken before and after the treatments. About 10,000 pupils did not meet the objectives during the same period. Since criterion referenced measures are being introduced in the Title I Annual Report for the first time, a more detailed review of the findings is presented in that section. Furthermore, summaries of achievement in Reading English and Reading Spanish are presented separately for bilingual students.

Findings From Norm-Referenced Data

The data in table 18 and Table 19 reveal that the means for over 140,000 eligible public and nonpublic school participants in treatments lasting over three months indicated achievement ranging from 1.00 to 1.84 months growth for each month of participation in ESEA, Title I projects. The rates prior to Title I intervention and during intervention are displayed in illustrations 12 and 13. Appendix C contains data for an additional 6,000 ineligible participants in long duration reading treatments where achievement across the pretest to posttest interval ranged from 1.4 months to 2.4 months per month of intensive Title I activities.

Table 18

Reading Achievement in Grade Equivalent Units Across Grades One Through Twelve for Successful Eligible Nonpublic School Participants in Treatments Lasting Over Three Months in Fiscal Year 1973-74

Grade Interval	Participants		Rate in Months/Month Before Treatment	Rate in Months/Month During Treatment
	Treated	Tested		
1-3	12,395	9,862	.39	1.21
1-3	290	250	NA 2/	1.29
4-6	11,181	9,095	.42	1.22
4-6	401	296	NA	1.56
7-9	4,353	3,237	.48	1.33
10-12	617	408	.56	1.84
TOTAL	29,237	23,148		

1/ When a group mean fell above the criterion established for eligibility (educational disadvantagement), the entire group was arbitrarily defined as an ineligible group for purposes of analysis.

2/ Not available from local education agency reports.

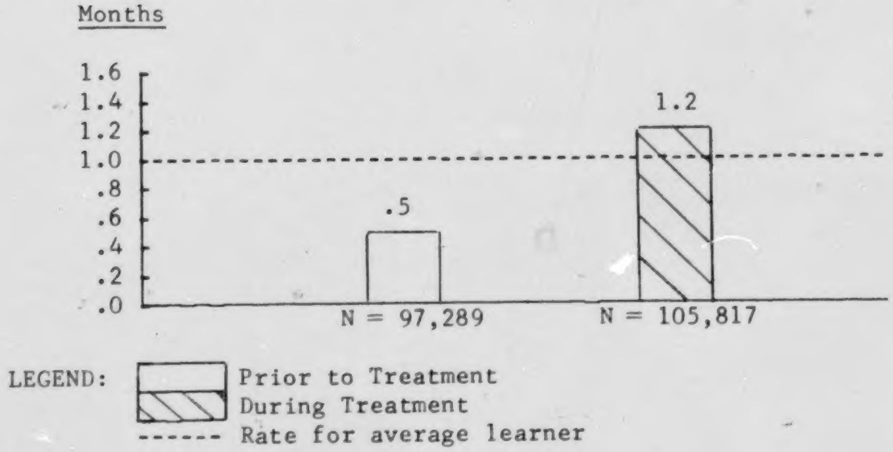
Table 19

Reading Achievement in Grade Equivalent Units Across Grades One Through Twelve for Successful Eligible Public School Participants In Treatments Lasting Over Three Months in Fiscal Year 1973-74

Grade Interval	Participants		Rate in Months/Month Before Treatment	Rate in Months/Month During Treatment
	Treated	Tested		
1-3	39,655	32,331	.47	1.14
1-3	7,227	5,664	NA 1/	1.53
4-6	56,811	46,001	.52	1.12
4-6	2,642	2,317	NA	1.15
7-9	23,106	17,304	.52	1.40
7-9	623	606	NA	1.49
10-12	20,554	13,526	.42	1.00
10-12	112	92	NA	1.38
TOTAL	150,730	117,841		

Illustration 12

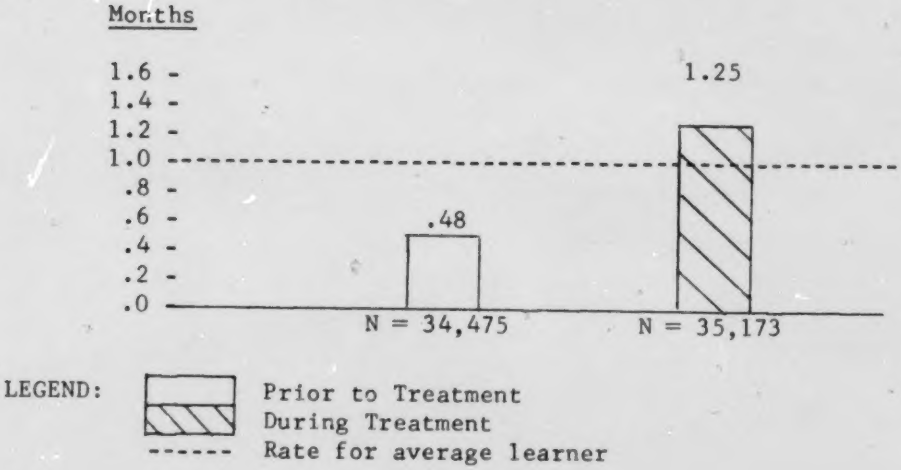
Elementary Reading
Rate of Gain for Each Month of Treatment
ESEA, Title I - 1973-74



1/ Not available from local education agency reports.

Illustration 13

Secondary Reading
Rate of Gain for Each Month of Treatment
ESEA, Title I - 1973-74



Norm-referenced achievement data where grade equivalent units were unavailable were reported in percentile ranks as pretest means and posttest means. The elementary Title I target population, which typically is drawn from below the 23rd percentile, must achieve about one-half year's growth in grade equivalent units to maintain its relative position. An elementary target population that achieves approximately 8 months growth (in this tail of a normal distribution) would advance on an average of four to six percentile points depending upon the test and grade placement involved. The data in table 20 contain the distribution by grade where the pretest means were five or more percentile points lower than the posttest means. The summary is a tabulation of both eligible and ineligible pupils whose group means indicated an improvement of five or more percentile points while participating in the Title I funded reading activities.

The data in table 20 indicate that the district means taken from about 4,500 public and nonpublic participants demonstrated achievement beyond expectation. The larger numbers found in grades one through three were expected since the participants' scores reflect early reading skills and are not easily interpreted with the historical growth rate analysis involving grade equivalent units. The groups of participants discussed here advanced at least five percentile points closer to the median (50th percentile) while participating in ESEA, Title I remedial reading activities.

Table 20

Summary of Selected Reading Achievement Data
for Successful Participants by Eligibility

	School Type	Grade Interval	Number of Participants	
			Treated	Tested
Eligible	Public	1-3	2,571	1,257
		4-6	346	292
		7-9	235	178
		10-12	239	107
	Nonpublic	1-3	20	19
		7-9	21	21
	Subtotal		3,432	1,874
Ineligible	Public	1-3	2,255	2,207
		4-6	73	73
		7-9	176	135
		10-12	37	32
		1-3	121	91
		7-9	100	73
	Subtotal		2,762	2,611
	TOTAL		6,194	4,485

Appendix G contains the distribution of about 37,000 eligible public or nonpublic participants whose group means indicated no growth beyond that which was expected in the absence of ESEA, Title I supplementary services. Appendix H refers to over 7,000 participants whose group means also failed to exceed performance attained in the past. While the means taken from these 44,000 participants are less heartening, the successes of the 145,000 long duration treatment youngsters, coupled with the 23,000 short duration treatment participants as measured by norm referenced achievement tests, indicated that most districts not only were able to arrest the academic deterioration of the learners but were able to help the target populations catch up to their more advantaged peers.

Criterion Referenced Test Data

During fiscal year 1973-74, the State pilot tested the concept and initial implementation phase of accepting cognitive measures or observations generated by criterion-referenced tests. Criterion referenced tests are composed of test items specific to pupil behavioral or performance objectives. Test publishers specify the number of items (for particular objectives) that is sufficient to conclude that an objective has been mastered by an individual pupil. An ESEA, Title I target youngster in the sixth grade might be addressing a reading objective leveled for the third grade. Out-of-level testing is not a major consideration in elementary grades (unlike norm-referenced testing on some devices) since objectives are addressed in a continuum of sequential difficulty. The initiation of criterion-referenced testing as an exploratory effort required (1) inquiry into selected concepts not common to norm-referenced testing, (2) investigation as to when such devices might be appropriate, (3) development of a means to aggregate data across districts and different devices and a (4) delineation of some limitations associated with the approach.

Differences in conceptualization. A pupil's score taken from a norm-referenced test (where test items are selected upon their abilitty to discriminate between pupils) permits evaluators to assess a pupil's achievement relative to other pupils in the original norming population. Criterion-referenced test items do not contrast pupil's relative placement, but rather yield information as to whether a specific performance objective has been mastered. Usually there are several items that are associated with a single objective. In other words, the focus with criterion-referenced tests is on the achievement or mastery of a particular skill rather than a pupil's relative position on a test in reference to a norm.

Criterion referenced objectives permit the pretest to serve as a diagnostic instrument for isolating skill deficiencies for each participant. The information from such a device allows the teaching staff to prescribe specific treatments for identified deficiencies. The utility of criterion referenced devices serves as an identification of pupil needs and skill achievement as well as a diagnostic tool for instruction.

Potential situations for application. Remedial treatments of short duration and/or intensity (e.g., summer schools) typically are designed to address only a few behavioral objectives. Alternately, there are Title I treatments designed to serve highly transient populations (e.g., neglected youth, delinquents, pregnant teenage girls) where there would be a limited exposure to the supplementary activities. On other occasions where federal monies are redistributed or released late in the regular school terms and a treatment may be extended to include new participants, the limited time allows only a narrow focus on selected skills. Similarly, since the concern in the measure is a performance objective in reference to a hierarchy of skills (not a norming population), criterion-referenced tests may be legitimately administered to groups of pupils not usually included in a norm-referenced standardization group. With criterion-referenced materials, local education agencies may confine the content of a pretreatment, interim, or posttreatment assessment to the objectives under consideration.

Procedures of data aggregation and reporting. School district personnel were permitted to select whichever standardized criterion-referenced system that appealed to them. Consequently data were submitted by the LEAs to the SEA from several criterion-referenced devices. A survey of the most common commercially prepared systems as indicated in the applications was conducted. From this survey an index of objectives common to the several systems was developed and included on a reporting form. The publisher's indication of level (difficulty) was taken at face value as was the publisher's criterion for "mastery".

For each indexed objective at each level, a statewide frequency tabulation of the pupils' mastery behaviors was composed for both the pretest and posttest administration data. The number and percent of Title I pupils demonstrating non-mastery across districts prior to treatment as well as the number and percent of these same pupils demonstrating mastery at the conclusion of the treatments are included in this report.

Limitations with criterion-referenced test objectives data. Currently much of the behavioral assessment must be accepted strictly in terms of content validity, as opposed to more carefully defined validation techniques associated with norm-referenced achievement tests. In other words, the state of the art with criterion-referenced testing and objectives requires that the publishers' definitions of mastery as well as the sequencing and hierarchial arrangement of objectives be accepted on face validity until validated empirically.

Similarly, while criterion-referenced approaches yield data hitherto not available, some information traditionally available from test scores is lost. There are no grade equivalent units reported (or available) and grade equivalents have been the traditional index of achievement. Furthermore, the objective mastered by the pupil is the reporting unit, without regard to the pupil's grade placement. A typical sixth grade pupil in Title I may be addressing third grade level objectives in a remedial treatment. Additionally, the State elected to use objective mastery as the reporting unit. For example, mastery of an objective may have required a correct response on four out of five items for the objective. If a pupil correctly answered two out of five items at the pretest and three out of five items on the posttest, the pupil failed to indicate mastery at either testing point even though the pupil increased the number of correct responses associated with the objective.

Criterion-referenced or domain-referenced objectives with associated test items hold considerable promise as both a tool for measuring achievement and as a means of instructional management. The reading and mathematics criterion-referenced objective data that follow describe pupil mastery at various levels in a hierarchy of skills. Illustrations are included so that the skills from the hierarchy may be relevant to the changes in proportion of pupils failing particular objectives prior to treatment and subsequently mastering the objectives at the conclusion of the treatment. If the promise of criterion-referenced objectives data materializes, particular approaches to remedial instruction may be correlated to objectives addressed and mastered.

Findings from criterion referenced test data. The classification system for reading objective topics was divided into five areas: phonetic analysis, structural analysis, vocabulary, comprehension and study skills.

The data for each area are presented in tables 21, 22, 23, 24 and 25, respectively. An illustration of a typical commercially prepared objective precedes each table so that the tabled data may be related to one of the behaviors sought by the measure. The data are aggregated across all grade levels. Under the caption "Failed Pretest", "N" refers to only the pupils who failed the pretest while the percent column refers to the percentage of participants who failed the pretest based upon the number of pupils who were tested for mastery of a particular objective. Under the caption "Mastered on Posttest", "N" refers to the pupils who had failed the objective at the point of pretest but had demonstrated mastery at the time of posttesting. Percent, in this case, refers to the number of participants demonstrating mastery at the posttest divided by the number of pupils failing that objective at the pretest.

Phonetic analysis, the rudimentary skills for some methodologies required for reading the printed word include a code-breaking capacity. Phonetic analysis frequently relates a spoken sound to a letter or letter combination.

Objective No. 2105 [1/]   Consonant Blends   Level: 1

> Given a picture, the word for which has the initial blend missing, you will identify from a list, the correct initial blend to complete the word:
> / bl / . [2/]

System: Individualized Criterion-Referenced Testing [3/]

Publisher: Educational Development Corporation

The heaviest emphasis on phonetic analysis objectives was placed on consonants and consonant blends, both audible and silent. At each level where remediation was attempted across a short interval of instruction, districts (and pupils) met with success in over sixty percent of the objectives attempted. The greatest single percentage success, as indicated in table 21, was achieved with the mastery of single letter vowels (a, e, i, o and u) previously failed by the target population.

1/ State index number.

2/ Verbatim from publisher's materials.

3/ Publisher's program identifier.

Table 21

Phonetic Analysis

Objective Topic	Levels Tested	Failed Pretest		Mastered On Posttest	
		N	%	N	%
Letter Recognition	1-3	408	30	248	60
Initial Consonants	1-5	704	48	458	65
Medial Consonants	1-3,5	343	26	230	67
Final Consonants and Blends	1-5,7	1,061	33	647	61
Consonant Blends	1-4,6-8	1,034	39	665	64
Vowels: Single Letters	1-5,8	1,107	40	740	73
Vowels: More than One Letter	1-4,6,7	1,502	55	832	55
Consonant Digraphs	1-4,6-8	516	33	332	64
Silent Consonants, Hard & Soft C & G	1-4,8	475	39	344	72
Rhyming Words	1-3,5	503	38	322	64

Structural analysis, the knowledge or word composition and elementary sentence structure require skills of analysis so that common elements (e.g., prefixes) when encountered may be detected and unfamiliar words decoded.

Objective No. 2203 Endings Level: 6

Identify the correct plural form of a word (irregular, y word, or s word)

System: Individual Pupil Monitoring System

Publisher: Houghton Mifflen

Word endings apparently gave the target population difficulty, especially in the early grades, according to the data in table 22. Not only were endings the most frequently addressed objectives but were the least successful in being mastered. In contrast, objectives involving prepositions in the same grades were the least frequently failed at the pretest, and the highest in percentage mastered (73 percent) at the posttest.

Table 22

Structural Analysis

Objective Topic	Levels Tested	Failed Pretest		Mastered On Posttest	
		N	%	N	%
Compound Words	1-5,8	544	41	301	55
Contractions	1-5	500	36	307	61
Endings	1-4,8	1,215	51	580	48
Prefixes, Suffixes, Affixes	1-8	888	52	479	54
Syllables	1-8	634	41	383	60
Prepositions, Phrases	1-4,8	59	45	43	73
Sentence Structure	1-8	640	45	381	59
Punctuation	1-4,8	124	80	81	65

Vocabulary, including the recognition of words for general meaning, similar sounds, opposites in relation to other words, or similarity in connotation are skills that are required independently even before the eventual interpretation within the context of textual narrative.

Objective No. 2304 Synonyms Level: 3

The student will demonstrate an understanding of synonyms by saying or writing one for each word spoken by the teacher.

System: SCORE

Publisher: Westinghouse Learning Corporation

Objective No. 2305 Word Meaning Level: B

The student will define words in isolation by matching certain words with their definitions. (Word definition in isolation).

System: Prescriptive Reading Inventory

Publisher: CTB/McGraw-Hill, Inc.

The data in table 23 indicate that objectives dealing with word meaning were the overwhelming choice for remediation. However, given the constraints of the methodology, intensity of treatment and other implementation factors, just over 50 percent of the target population met the particular word meaning objectives.

Table 23

Vocabulary

Objective Topic	Levels Tested	Failed Pretest		Mastery On Posttest	
		N	%	N	%
Antonyms	1-3,5-8	571	45	280	49
Homographs	1-4,6	327	40	151	46
Homonyms	1-4,7-8	425	46	208	49
Synonyms	1-8	720	49	352	49
Word Meaning	1-8	1,475	49	762	52

Study skills, the vehicles of printed matter required user skills. Referencing materials are organized consistently according to a pattern specific to the variety of the source involved. Pupils are taught the organizational assembly so that the tools of referenced knowledge may be accessible to them.

Objective No. 2503   Aides: References, Footnotes, Bibliography   Level: E

The child will locate a topic in response to a SEE reference (e.g., having located "Mohawk Indians SEE Iroquois Indians", the child locates the topic).

System: The Wisconsin Reading Design

Publisher: Interpreted Scoring Systems

Objectives for skills related to indexing, alphabetizing and other visual or tabular aids were the least satisfactorily mastered. The data in table 24 indicate that the objectives related to tables of contents, appendices, other reference sources, bibliographies, etc., were mastered by roughly half the target population combined across all levels addressing these objectives commonly taught in grades three through five.

Table 24

Study Skills

Objective Topic	Levels Tested	Failed Pretest		Mastery On Posttest	
		N	%	N	%
Titles, Table of Contents	1,3-6,8	421	73	191	45
Aids: Visual, Tabular	1-3,8	359	83	60	17
Aids: References, Footnotes, Bibliography	1,4,5,8	214	54	111	52
Selection of Information from Sources	1,3-5	34	52	11	32

Comprehension, involving the subskills of reading are developed to support the capacity of the reader to detect the literal and/or inferential meaning of the printed paragraph. Understanding that which is read is a culmination of several constellations of subskills applied to narrative test.

Objective No. 24 Main Idea Level: 5

> The student will demonstrate his ability to understand the main idea of a printed paragraph by selecting, from a set of printed choices, a sentence that states the main idea of the paragraph and should be placed at the beginning of the paragraph.

System: Fountain Valley Teacher Support System in Reading

Publisher: Richard L. Zweig, Associate, Inc.

The objective devoted to the understanding of what was read, inferring beyond strictly what was literally printed and organizing mentally the main ideas, facts and necessary details, received a priority among remedial treatment implementors. With the exception of recognizing literary forms, according to table 25, mastery by objective for the combined levels tended to be accomplished by approximately 50 percent of the target population.

Table 25

Comprehension

Objective Topic	Levels Tested	Failed Pretest		Mastery On Posttest	
		N	%	N	%
Fantasy and Reality	1-5,8	309	38	158	51
Classifying	1-6,8	347	35	182	52
Inferences, Cause of Effect	1-8	2,431	59	1,358	56
Facts and Details	1-8	1,591	53	772	49
Following Directions	1-4,6-8	414	43	215	52
Main Ideas	1-8	2,048	60	1,040	51
Picture Clues	1-5	208	24	102	49
Drawing Conclusions	1-8	1,323	61	676	51
Sequence	1-8	1,418	55	708	50
Author's Purpose and Techniques	1-8	269	58	128	48
Setting and Character Analysis	1-7	1,485	62	741	50

Reading criterion-referenced objectives summary. The greatest number of objectives selected for remedial attention involved comprehension skills. In the short treatments assessed by the criterion referenced approach, about 50 percent of the objectives were mastered in each category. The second most popularly selected objective cluster was directed at code-breaking skills especially the lower phonics skills involving consonants, blends, and single letter vowels. In excess of sixty percent of these objectives was attained in the course of the instruction.

Mastery of selected objectives does not mean that a target pupil is currently "on grade level" with respect to reading as well as his or her more advantaged peers. Rather, the accomplishemnt of specific behavioral objectives as measured by criterion-referenced test material indicates that a pupil mastered a skill, usually anticipated as having been mastered one to two years earlier in his educational development, while participating in an ESEA, Title I supplementary treatment. The disadvantaged learners have moved up the ladder in the hierarchy of skills beyond where they previously may have stalled without the supplementary instruction.

Reading Achievement in English by Bilingual Participants

School districts elected to assess facility in reading English by administering a typical norm-referenced reading achievement test such as the Metropolitan Achievement Test or a device from the Cooperative Inter-American Achievement Test series. Since the typical English language reading tests were not normed on non-English or limited English speaking pupils, cautious interpretations prevail when reviewing the results. Furthermore, most districts employing this approach administered an age/grade level of the device quite different (lower) from the actual age of the participants. The assumption made when employing a reading test designed for skill level assessment for English reading facility by bilingual pupils is that a measure of translation is operating, rather than a leveled skill inherent in reading. This phenomenon becomes especially apparent when scores from the word recognition or vocabulary subtests are compared to the scores from the comprehension subtests in the same device. The districts reported the combined (averaged) subtest scores, however, as a composite reading score, an act that may have operated to conceal part of the impact of the improved translation capacities.

As with all district data, inferential statistical analyses between pretest and posttest distributions were conducted to determine whether real differences were detected. The aggregation of the data, then, is based upon detecting a significant (positive) difference ($p \leq .05$) as reported by the districts.

Table 26 contains the statewide average rates of gains across the varying treatment periods for bilingual pupils' English reading scores as measured before and after the treatments by norm-referenced achievement tests from the Anchor Series 1/ in grades one through nine.

Table 26

Norm-Referenced English Reading Achievement Rates of Improvement In Grade Equivalent Units for Successful Groups Of Bilingual Participants in Treatments Spanning More Than Three Months

Grade	School Type	Number Treated	Number Tested	Rate of Gain Month/Month
1-3	Public	2,607	1,170	.43
4-6	Public	2,411	1,038	.93
4-6	Nonpublic	246	144	.86
7-9	Public	3,035	1,185	.69
TOTAL:		8,299	3,537	.68 average

The reading translation capacity improved on an average of about 7-tenths month for each month of instruction for the 3,500 successful participants. Additionally, there were 209 tested participants from an additional 603 treated pupils assessed by means of the tests described above who met the objectives in shorter duration sessions.

1/ The series includes seven devices that met the requirements of standardization before being included in an equating study.

Table 27 consists of a summary of English reading improvement as measured before and after the remedial treatments largely by the Cooperative Inter-American (CIA) Series Test of Reading or Test of General Abilities in English. Since raw scores were reported (accompanied by appropriate inferential statistical analyses) the summary below refers to groups aggregated as to success or failure, a reflection as to whether a true difference was detected between pretest and posttest administrations.

Table 27

Reading Achievement in English for Groups Tested with Spanish/English Measures

Grade Interval	Number Treated	Number Tested	Met Objective	Measurement Device
K	35	29	yes	TOBE 1/
	431	361	yes	CIA
	32	25	no	CIA
1-3	876	516	yes	CIA
	946	416	yes	SESAT 2/
	144	96	no	CIA
4-6	338	275	yes	CIA
	95	50	no	CIA
7-9	66	31	yes	CIA
	48	26	no	CIA

Reading Achievement in Spanish By Bilingual Participants

In situations where (1) districts attempted to preserve the Spanish bilingualism of a target population and/or (2) general academic development of the participants was to be continued as the youngsters acquired facility in the English language, measures of achievement were assessed in reading Spanish. With one exception, most of the data were reported in a raw score format. A correlated t-ratio or repeated measures analysis of variance was applied to the data to determine whether a genuine difference existed between the pretest and posttest sets of raw scores.

1/ Test of Basic Experiences (English Form)

2/ Stanford Early School Achievement Test (English Form)

The fact that scarcely one-third of the participants were tested twice may reflect a highly mobile population. Most of the participants received Spanish reading instruction in the Bronx, although several other districts in the City of New York reported increased Spanish dominant pupils of school age. Very few prekindergarten or kindergarten scores were reported inspite of several measurement devices (Peabody Picture Vocabulary Test, Boehm Test of Basic Concepts, Test of Basic Experiences, and Stanford Early School Achievement Tests) that are available in Spanish versions and measure concepts basic to reading in any culture. Several districts reported that participants failed to register a meaningful score on the pretest, which suggested that (1) the devices may not be reliable or that (2) prereading literacy in Spanish is minimal among the participants.

The data in table 28 were collected largely on the Cooperative Inter-American Prueba de Lectura which samples Spanish vocabulary and comprehension abilties. All raw scores summarized below were collected from districts conducting Spanish reading treatments spanning more than three months.

Table 28

Reading Achievement in Spanish

Grade Interval	Number Treated	Number Tested	Met Objective	Measurement Device
Pre-K	46	31	yes	TOBE 1/
	31	31	yes	Boehm 2/
K	22	14	yes	Boehm
1-3	1,160	364	yes	Cutler 3/
	119	46	yes	Boehm
	2,450	1,631	yes	CIA
4-6	1,071	636	yes	CIA
	120	96	yes	Cutler
	60	21	no	Cutler
	94	76	no	CIA
7-9	334	97	no	CIA
	1,422	444	yes	CIA
10-12	752	129	yes	
TOTAL:	7,681	3,292 - met objectives 194 - failed objectives		

1/ Test of Basic Experiences (Spanish Form).

2/ Boehm Test of Basic Skills (Spanish Form).

3/ Cutler Diagnostic Test of Reading.

Among the 45 percent tested for improvement in reading Spanish, the group means for 3,293 bilingual pupils indicated that the objectives had been met.

Reading Achievement Summary

The means taken from approximately 170,000 ESEA, Title I participants without the complications of bilingualism indicated that project objectives had been widely met. About 44,000 similar youngsters failed to exceed the performance expected in the absence of the Title I services. The successful participants not only had ceased falling further behind, but were catching up to their more advantaged peers as indicated by norm referenced achievement data. Judgement upon the findings from the State's initial foray into criterion-referenced testing might well be suspended until more is known about what might be accomplished in remedial treatments of short duration. Objectives in the area of comprehension, acknowledged by experts to be the most difficult, were consistently met by over 40 percent but less than 70 percent of the target group. While proportionally underrepresented among those treated, about 5,000 tested bilingual pupils steadily advanced in reading English while over 3,200 improved in the ability to read Spanish.

Mathematics

While remedial efforts in reading ranked highest among district priorities, approximately 193,000 project participants received instruction in mathematics. For purposes of analysis, project group means were segregated as to (1) the source of the data (public vs. nonpublic), (2) the duration between test administrations (more vs. less than or equal to three months), (3) the score type reported (grade equivalents, percentiles, standard scores, etc, (4) the inclusion of a prediction of growth in the absence of an ESEA, Title I supplementary treatment, (5) whether the group mean at the point of pretest administration exceeded the 23rd percentile (eligible vs. ineligible participants) and (6) the type of measure collected (norm vs. criterion-referenced). Appendix I includes data for 14,000 eligible and ineligible public and nonpublic pupils whose group means from norm referenced devices indicated that the objectives for long duration projects were not met. Similarly, Appendix J includes summary data for 4,400 eligible and ineligible public and nonpublic mathematics participants in short duration projects whose norm-referenced means indicated that the objectives were not met. Appendix K contains summaries of eligible and ineligible participants in public and nonpublic schools where approximately 20,000 participants exceeded the performance expected in the absence of the ESEA, Title I supplementary activities across projects lasting less than three months.

Findings from norm-referenced test data. The more heartening mathematics achievement data obtained from norm-referenced tests are reported in tables 29, 30 and 31. The project group means indicated that about 60,000 public and nonpublic school participants achieved over one and nine-tenths months growth for each month between pre- and posttest administrations as measured by norm-referenced achievement tests. Table 32 includes an additional thousand youngsters who moved their group mean percentile rank position closer to the 50th percentile by at least five points. Illustration 14 depicts the rates of growth for those eligible successful elementary mathematics participants with an estimated pretreatment rate of gain (in months) of about one-half months as well as a slightly larger population 1/ with a during treatment average rate of one and one-half months growth. Illustration 15 indicates approximately the same pretreatment rate of growth, but reveals that the target population demonstrated almost two months growth for each month of treatment exposure between pretest and posttest dates of administration.

Table 29

Mathematics Achievement in Grade Equivalent Units Across Grades One Through Twelve for Successful Eligible Public School Participants In Treatments Lasting Over Three Months in Fiscal Year 1973-74

Grade Interval	Participants		Rate in Months/Month Before Treatment	Rate in Months/Month During Treatment
	Treated	Tested		
1-3	18,499	14,607	.46	1.30
	2,764	2,411	NA 2/	1.55
4-6	20,073	15,969	.55	1.44
	680	559	NA	1.43
7-9	11,620	7,558	.51	1.83
	90	79	NA	1.76
10-12	12,021	5,117	.46	2.01
	144	93	NA	1.67
TOTAL	65,891	46,393		

1/ All scores were paired, in that all pupils reported here had both a pretest and a posttest. The number of pupils reported as treated is larger in every table. Only means of paired scores were analyzed. Since some districts employ analyses that don't involve the generation of a pretreatment rate of gain -- but do permit the computation of rates across treatments, the number tested and reported across treatment exceeds the number with a pretreatment rate.

2/ Not availabe from local education agency reports.

Table 30

Mathematics Achievement in Grade Equivalent Units Across Grades One Through Nine for Successful Ineligible Participants In Treatments Lasting Over Three Months in Fiscal Year 1973-74

School Type	Grade Interval	Participants Treated	Participants Tested	Rate in Months/Month During Treatment
Public	1-3	1,011	915	1.47
	4-6	1,867	1,473	1.54
	7-9	407	353	1.68
Subtotal		3,285	2,741	
Nonpublic	4-6	217	179	1.13
Total		3,502	2,920	

Table 31

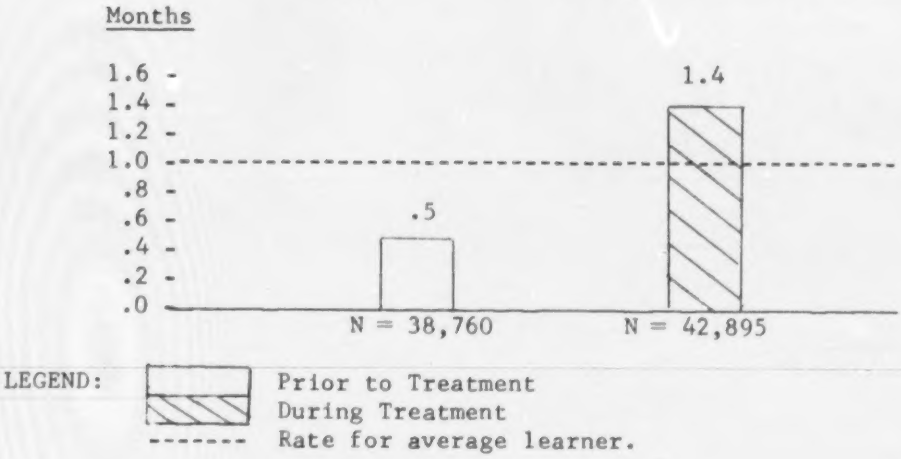
Mathematics Achievement in Grade Equivalent Units Across Grades One Through Twelve for Successful Eligible Nonpublic School Participants In Treatments Lasting Over Three Months in Fiscal Year 1973-74

Grade Interval	Participants Treated	Participants Tested	Rate in Months/Month Before Treatment	Rate in Months/Month During Treatment
1-3	4,166	2,730	.40	1.45
	35	34	NA 1/	1.69
4-6	7,903	6,454	.53	1.37
	149	131	NA	1.24
7-9	2,809	2,040	.59	1.75
10-12	297	195	.63	2.29
TOTAL	15,359	11,584		

1/ Not available from local education agency reports.

Illustration 14

Elementary Mathematics
Rate of Gain for Each Month of Treatment



Where remedial mathematics pupils had been achieving about one-half months growth prior to ESEA, Title I intervention, the norm-referenced tests indicated growth for the eligible elementary students at one and one-half months for each month of supplementary service. Such students were closing the gap between themselves and their more advantaged peers at a rate of almost one-half months for each month of exposure to Title I services. At the secondary level, the rate was about nine-tenths month over and above that required to gain one month for each month of school experience.

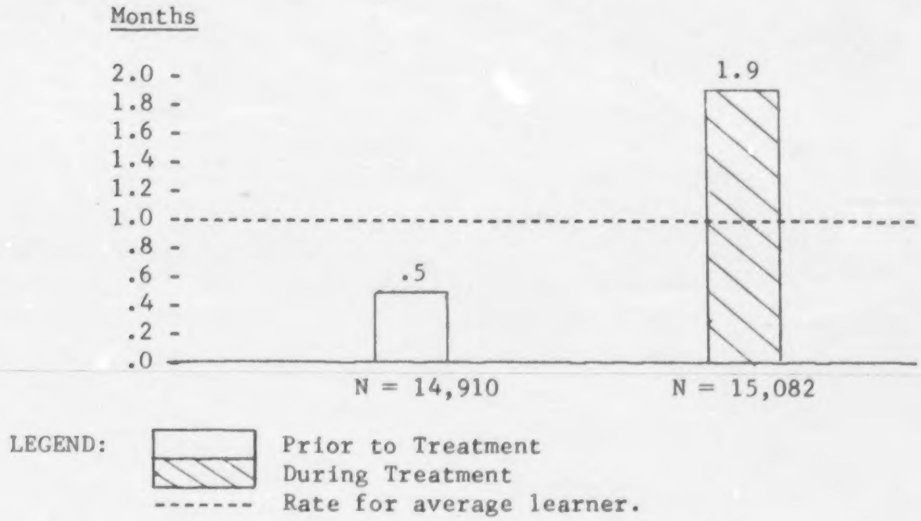
Table 32

Summary of Mathematics Achievement Data
Reported In Percentile Units for Successful Participants

School Type	Grade	Eligible	Treated	Tested
Public	1-3	yes	2,316	1,021
Public	1-3	no	1,931	1,882
Public	7-9	yes	69	48

Illustration 15

Secondary Mathematics
Rate of Gain for Each Month of Treatment



Findings from criterion-referenced test data. The classification system for mathematics objective topics was divided into nine areas. Not all areas receive equal attention for each level with respect to curricula outlined in the State syllabus. An illustration of a typical objective precedes each table so that the tabled data may be related to one of the behaviors sought by the measure. The data in tables 33 through 40 indicate the levels of the objective addressed, the number of pupils failing the objective at the time of pretesting, and what percentage that number represented of all pretested pupils on a particular objective, the number of pupils demonstrating objective mastery on the posttest, and the percentage mastering in relation to all pupils who failed the pretest on a particular objective.

Numbers and operations, the introductory concepts of quantity, number lines, number facts and operations are usually taught in the early elementary grades. Basic operations such as addition, subtraction multiplication and division are often the remedial skills pursued in ESEA, Title I remedial mathematics activities.

Objective No. 1108 Subtraction: Concept & Skills Level: 2

> Given a subtraction problem, the student will be able to find the difference and check the solution (whole number sums to 18).

System: Individualized Mathematics System

Publisher: Ginn and Company

Objective No. 116 Percent Level: 8

The student will demonstrate his ability to name fractional and decimal equivalents of given percents by selecting, from a set of printed choices, the fractional, decimal or percent equivalent of a given number.

System: Fountain Valley Teacher Support System in Mathematics

Publisher: Richard L. Zweig Associates, Inc.

The data in table 33 reveal that addition, subtraction, multiplication and division were the major objectives for all combined elementary levels (one through six). With the exception of number theory, pre-operational concepts, and negative numbers, the target population experienced the most success in meeting the objectives in the four basic operations so necessary to mathematics achievement.

Table 33

Numbers and Operations

Objective Topic	Levels Tested	Failed Pretest		Mastery On Posttest	
		N	%	N	%
Pre-Operational Concepts 1/	1-5	373	53	238	64
Whole Numbers	1-5,7,8	443	51	254	57
Fractions 2/	1-8	530	63	297	56
Decimals	1,3-8	325	58	228	70
Negative Numbers	3,4,7	25	51	17	68
Real Number System	1,3-5,7	137	75	49	36
Addition: Concepts and Skills	1-6	561	43	364	65
Subtraction: Concepts and Skills	1-6	765	59	446	58
Multiplications: Concepts and Skills	1-6	622	64	378	61
Division: Concepts and Skills	1-6	597	71	302	51
Properties of Operations & Relations	1-5,7	129	69	64	50
Numeration Systems	1-3,5,7	127	64	56	44
Number Sentences	1,3-5,7,8	310	64	166	54
Estimation, Rounding	1,3-8	223	76	89	40
Percent	1,3-5,7,8	215	74	116	54

1/ Pre-Operational Concepts: equivalence, equality, order, number, numeral, fewer, more,...

2/ Fractions (i.e., positive rational, numbers and zero).

Geometry, especially spatial relationships including plane and three-dimensional representations are introduced early in the elementary child's mathematical development in a spiral fashion, often in alternate years (levels 1, 3, 5 and 7 opposite the objective topics).

Objective No. 1205 Polygons: Triangles, Quadrilaterals, and Others Level: 4

The student will be able to identify geometric figures: triangle, rectangle, square and parallellogram.

System: Individual Pupil Monitoring System

Publisher: Houghton Mifflin

The disadvantaged learner must develop special terminology to associate the two-or three-space representation with a defined and labeled mental image. The data in able 34 indicate that the level I concepts and language associated with symmetry and similarity were mastered by more than 70 percent of the respective treatment groups.

Table 34

Geometry

Objective Topic	Levels Tested	Failed Pretest		Mastered On Posttest	
		N	%	N	%
Points, Lines, Rays, Line Segments	1,3,5	149	76	54	36
Parallel and Perpendicular Lines	1	33	66	19	58
Angles	1,3,5	112	81	63	56
Polygons: Triangles, Quadrilaterals	1,3,5-7	171	62	74	43
Circles	1,3,7	54	72	18	33
Polyhedra: Prisms, Pyramids & Others	5	114	96	19	17
Spheres, Cylinders, Cones	5	115	97	19	17
Symmetry	1	49	49	36	73

Measurement, involving the mathematical concepts of scale, calibration, interval, etc., especially as they relate to temperature, time and money, receive considerable remedial attention for the disadvantaged youngster.

Objective No. 1305 Monetary System Level: 3

Given a set of coins, you will identify the total value of the set (quarters, dimes, nickels, and pennies).

System: Individualized Criterion-Referenced Testing

Publisher: Educational Development Corporation

The data in table 35 indicate that at several levels about 50 percent or more of the participants originally selected due to deficiencies in measurement concepts, especially with respect to scales, rulers, coin counts, etc., can master such skills given the remedial treatments provided in the brief time provided for instruction.

Table 35

Measurement

Objective Topic	Levels Tested	Failed Pretest		Mastered On Posttest	
		N	%	N	%
Nonstandard Measures	1,3-5	59	50	34	58
English System	1-6,8	217	62	115	53
Temperature	3-5	34	37	21	62
Monetary System	1-6	215	72	105	49
Time and Date	1-4,8	74	43	31	42

Statistics and probability, the concepts of frequency and especially averages (means) are repeatedly cited as skill areas needing remediation for junior high school target area youngsters.

Objective No. 1504 Probability: Basic Concepts and Simple Events Level: 6-7

> Given the number of each of two kinds of objects in a container, the student will be able to complete the probability of selecting one of a given kind of random (probability of simple events).

System: Prescriptive Mathematics Inventory

Publisher: CTB/McGraw-Hill

The most often-addressed objectives were level five objectives that deal with ranges of numbers, averages, the middle most number in a distribution (median) and the most frequent number in a distribution (mode). Averaging, as a skill, is the most necessary of the series and judging from the finding in table 36 an extremely difficult skill to learn across a short treatment.

Table 36

Statistics and Probability

Objective Topic	Levels Tested	Failed Pretest N	Failed Pretest %	Mastered On Posttest N	Mastered On Posttest %
Graphs: Picture, Bar, Line, Circle	5,7	36	27	17	47
Mean, Median, Mode, Range	5	117	98	2	2

Sets, the notions surrounding belonging, grouping, mutual exclusivity, union, matching, identity and intersection constitute complex abstractions. The capacity to perceive such concepts is supportive of mathematical logic.

Objective No. 1603 Matching, Equivalence, Cardinal Numbers, Finite and Infinite Sets Level: 1

Given a set of objects, you will identify the cardinal number of the set (to nine numbers).

System: Individualized Criterion Referenced Testing

Publisher: Educational Development Corporation

The data in table 37 reveal that set theory, especially at level 5 was difficult to master. Apparently, disadvantaged learners were able to perceive the membership or belonging of elements to a single set, but the simultaneous membership in more than one set (intersection, union, and Venn diagram pictoral representation) is a more difficult concept to establish.

Table 37

Sets

Objective Topic	Levels Tested	Failed Pretest N	Failed Pretest %	Mastered On Posttest N	Mastered On Posttest %
Identification, Membership, Notation	1,3,5,7,8	267	64	133	50
Empty Set, Subset, Equal Sets, Disjoint Sets	1,3,5	171	57	45	26
Matching Sets	1	33	52	13	39
Union, Intersection, Cross Product	5	119	100	0	0
Geometric Applications, Venn Diagrams	5	113	79	16	14

Logical thinking, the higher order of reasoning capacities require the skills of analysis of component parts and the synthesis of solutions. Inductive reasoning (where a principle, or rule is developed from the parts) and deductive reasoning (where a known rule or principle is applied to a problem) lead to hypothesis testing and problem solving using the basic skills, especially mathematical tools.

Objective No. 1804 Deductive Reasoning Level: 4

The student will demonstrate his ability to make deductions using Venn diagrams by selecting, from a set of printed choices, the statement that expresses an accurate deduction from data shown in a Venn diagram.

System: Fountain Valley Teacher Support System in Mathematics

Publisher: Richard L. Zweig, Associates, Inc.

Two-thirds of the remedial target population, formerly deficient in relating one phenomena to another probable condition, mastered the logical connections required at the level 1 stage of development. These higher thought process objectives usually handled by the entire school-aged population were addressed by only a few Title I participants, as indicated by the data in table 38.

Table 38

Logical Thinking

Objective Topic	Levels Tested	Failed Pretest		Mastered On Posttest	
		N	%	N	%
Logical Connectives	1	59	75	39	66

Functions and graphs, the representations of paired relationships permit learners to recognize two variables in pictoral fashion. Deriving information from graphic form at an elementary level is a prerequisite to visualizing higher order functions (quadratic, exponential, etc.) in the latter grades.

Objective No. 1704 Graphs: Picture, Bar, Circle, Line Level: 9

Given a set of compound inequalities and a set of graphs, the student will match the inequality with the appropriate graph.

System: Instructional Objectives Exchange

Publisher: UCLA Graduate School of Education

The data in table 39 indicate that, in no case did 50 percent of the combined target population diagnosed as deficient accomplish the mastery of extracting graphically reproduced mathematics information for interpretation and analysis. These skills are so critical (and so often missing among disadvantaged learners) that several commercially prepared reading programs are also incorporating graph and chart analysis in an attempt to converge on such knowledges from both mathematics and reading domains.

Table 39

Functions and Graphs

Objective Topic	Levels Tested	Failed Pretest		Mastered On Posttest	
		N	%	N	%
Linear Functions and their Graphs	6	30	44	10	30
Graphs: Picture, Bar, Circle, Line	1,5,7,8	120	56	22	18

Analysis and applications of mathematics, including the number facts learned as concepts and operations are applied to the real problems in science, social studies, and personal business transactions. (The measures involve word problems and may be confounded by reading skills).

Objective No. 1902 Solution of Problem Level: 7-8

> The student will be able to solve a word problem involving the addition and division of whole numbers.

System: Prescriptive Mathematics Inventory (PMI)

Publisher: CTB/McGraw-Hill

The extraction of information from a paragraph or sentence, the determination of the appropriate concept to be applied, as well as the execution, the correct computation required are necessary prior to the solution of word problems. Table 40 indicates that 75 percent of the target population initially screened for treatments involving analyses, solutions, and numbers and operations was indeed deficient in the ability to solve such problems at the pretest, although approximately 40 percent of the participants selected for treatment did master the objectives at the respective levels by the conclusion of the treatment.

Table 40

Analysis and Applications of Mathematics

Objective Topic	Levels Tested	Failed Pretest		Mastered On Posttest	
		N	%	N	%
Mathematics: Numbers and Operations	1,5,6	197	78	81	41
Mathematics: Geometry	5	110	92	51	46
Analysis of Problems	1-5,8	180	73	71	39
Solution of Problems	1-5,8	243	73	83	34

Criterion-referenced test data summary. The use of criterion referenced objectives and measures in fiscal 1973-74 ESEA, Title I projects represented a departure from the age/grade norm-referenced approach of previous years. Initial problems in compatible coding, uniform reporting, aggregation of similar objectives and findings across several devices appeared and were resolved with various levels of success. The problems and their resolution, naturally, placed limitations of the interpretation of the data.

Districts electing to use criterion-referenced measures were confined to employing such measures across supplementary treatments lasting no more than 60 hours. From a review of the findings, it appears that where a particular remedial need exists among several needs, some objectives are more likely attainable for a larger percentage of participants than others (given the current instructional methodology and time constraints). A comparison of the findings under mathematics "measures" versus "logic" or "sets" appear to indicate greater success in objectives attainment in favor of instruction in "measures" where limited resources, limited time and the need for instruction in all three areas exists. 1/ An efficiency of this selection of instruction may emerge from such evaluation data in future years.

Mathematics achievement by bilingual participants. Some districts elected to employ mathematics tests written in English for pupils of limited or non-English speaking abilities. The inability to translate, of course, may affect subtest scores in problem solving, and on some devices, mathematics concepts. (The reliability of the measure is, therefore, suspect.) Other districts employed one of the Cooperative Inter-American Series Tests (Spanish versions) to assess growth in mathematics without confounding the mathematics measures with reading translation effects.

1/ A rival hypothesis might be that disadvantaged learners operating at the first five levels in mathematics may more quickly learn with tangible or concrete materials associated with concepts of measure rather than with the greater abstraction requirements of set theory and logic.

The data provided in table 41 reflect a true difference between pretest and posttest distributions for the groups of bilingual pupils receiving remedial mathematics instruction. The data were aggregated across treatments spanning more than three months. Appendix 42 contains similar data for treatments lasting less than three months.

Table 41

Mathematics Achievement Obtained From Participants With Limited or No English-Speaking Backgrounds

Grade Interval	Participants		Met Objectives	Measurement Device
	Treated	Tested		
Pre-K	46	31	yes	Cooperative Inter-American
K	32	25	yes	Cooperative Inter-American
	35	28	yes	Test of Basic Experiences
1-3	139	48	yes	Stanford Achievement Test
	883	437	yes	Metropolitan Achievement Test
	35	32	yes	Test of Basic Experiences
	1,032	760	yes	C.I.A. - Spanish form
	418	288	yes	C.I.A. - English form
4-6	278	50	yes	Metropolitan Achievement Test
	200	86	yes	Stanford Achievement Test
	145	96	no	Stanford Achievement Test
	450	377	yes	C.I.A. - Spanish form
	138	67	no	C.I.A. - Spanish form
	288	223	yes	C.I.A. - English form
7-9	120	87	yes	Stanford Achievement Test
	592	157	yes	Metropolitan Achievement Test
	47	42	yes	C.I.A. - Spanish form
	105	92	no	C.I.A. - Spanish form
	24	19	yes	C.I.A. - English form
10-12	113	26	yes	Metropolitan Achievement Test
	120	14	no	Stanford Achievement Test
TOTAL	5,240	2,716 met objectives 269 failed objectives		

Among the 2,985 bilingual participants tested (57 percent of those reported as treated), approximately 91 percent met the objective that a real (positive) difference existed between the pretest and posttest group distributions on the standardized mathematics achievement tests.

Table 42

Bilingual Mathematics Achievement Across Treatments of Short Duration

Grade Interval	Participants		Met Objectives	Measurement Device
	Treated	Tested		
K	32	25	yes	C.I.A. - Spanish form
1-3	109	89	yes	C.I.A. - Spanish form
	88	32	yes	Metropolitan Achievement Test
	183	130	no	Metropolitan Achievement Test
4-6	40	35	no	Wide Range Achievement Test
	57	24	yes	Metropolitan Achievement Test
	521	358	no	Metropolitan Achievement Test
7-9	330	160	no	Metropolitan Achievement Test

Mathematics achievement summary. The norm-referenced achievement data for long duration treatments indicated that about 60,000 participants in remedial mathematics activities funded under ESEA, Title I were closing the gap between themselves and their more advantaged peers at rates ranging between four-tenths and nine-tenths months for each month of participation. There were 14,000 pupils, also, who failed to exceed their past rates of performance. The criterion-referenced test data revealed that objectives relating to numbers and operation (basic remedial computation activities) were most often addressed and achieved in treatments of short duration. Additionally, 2,700 pupils, whose translation capacities may have been complicated by bilingualism, also met the objectives set forth in remedial mathematics services.

Achievement Summary

The interpretation of the data (inspite of the harsh constraints placed on the analyses by the evaluators) in reading, mathematics, English as a Second Language, reading English by bilingual pupils and reading Spanish by bilingual pupils indicated that pupils from prekindergarten through grades twelve either moved closer to the average (more advantaged) pupil's performance or accelerated their rates of growth concurrently with participation in district-designed ESEA, Title I projects.

> .....The group means for nearly 15,000 prekindergarten and kindergarten disadvantaged youngsters were found to be significantly different (and positive in direction) between pretest and posttest

distributions in the area of general cognitive readiness. The two levels advanced from a position of roughly the 13th percentile to the 21st percentile in a normal distribution. 1/

.....In English language fluency and aural comprehension, approximately 6,000 non-English or limited English speaking pupils demonstrated improvement beyond their performance at the outset of the projects.

.....About 5,500 bilingual participants demonstrated an increase in their capacity to read English. Additionally, 3,300 Spanish-dominant participants increased in their capacity to read Spanish.

.....In remedial mathematics projects, approximately 60,000 Title I participants closed the gap between themselves and their more normally achieving peers at a rate of over .5 months for each month of Title I treatment.

.....In remedial reading treatments, nearly 170,000 pupils who previously learned at an average rate of half that of advantaged pupils achieved 1.2 month for each month in ESEA, Title I supplementary services.

It should be noted that there are features of the peocedures applied to the data in this report which could produce a tendency to overestimate the effectiveness of the categorically aided compensatory education programs. However, many experts feel that no one factor would be expected to produce positive findings of the strength observed, and the possibility that all of such factors had combined in their most extreme form to produce such apparently favorable results where none had really occurred seems very remote.

Overall, the data indicated that in excess of 245,000 educationally disadvantaged project participants who were consistently meeting failure in the basic skill areas had not only arrested the rate of deterioration but were diminishing the distance between themselves and the norm by which they were being judged. In other words, while participating in the regular classroom and in supplementary services,the participants demonstrated the capacity to achieve at higher rates of growth than with the ESEA, Title I basic skills remedial activities. Districts, judiciously expending ESEA, Title I monies in New York State, again demonstrated that given supplementary resources, they can bring about changes in pupil behavior in the basic skill areas beyond the growth expected in the absence of funded projects for disadvantaged learners.

1/ Recalling that eligibility for the status of educational disadvantagement meant pupil achievement below the 23rd percentile, this target population may be considered to have closed the gap.

CHAPTER VIII

SPECIAL STUDIES OF COMPENSATORY EDUCATION REPORTS

The report examines several aspects of the efforts and results of selected compensatory education activities during 1973-74. The observations, a result of objective analysis, are critical and supportive of some practices that occurred with the expenditure of Title I, ESEA monies. The point of the examination was to gather information that is essential for decision makers who plan to replicate either a selected treatment or a whole project. Realizing that a particular remedial approach can never be identically replicated, there are elements of specially constructed remedial activities that may be analyzed in terms of effectiveness and efficiency for the purposes of replication. A decision to replicate a learning environment is made under the constraints of having a scarcity of resources and upon viewing competing or alternatives available for solving some problems associated with the target population.

In Chapter II, the priority subject matter areas for instruction were outlined as goals. Further, the criterion of success cited in Chapter II (Overview), Chapter VII (Achievement) and Appendix E (Exemplary Treatments) was defined as greater achievement (growth) during ESEA, Title I activities than occurred prior to such compensatory activities. While greater basic skill achievement, as measured by test scores, is not the only educational goal of educators, taxpayers, parents, and pupils, it is a fundamental goal of the State in this program. A measured change (acceleration) in achievement cannot be said to have been caused solely by ESEA, Title I activities. Rather, these studies examine the relationship between compensatory education efforts and recorded achievement.

The studies that follow outline several aspects of the problems, successes, and failures of compensatory education. In some cases, analyses of the measures used to isolate effective treatments revealed that the measures were inappropriately applied and contributed little or no knowledge to the effectiveness of the activities. In another case, the conditions required for delivering an expanded system of remedial activities could not be met rapidly enough for the system to operate effectively. An examination was made of one district's findings where support services (pupil personnel) were overlaid upon compensatory education remedial reading activities that already had been superimposed on the basic tax levy or regular school program. Perhaps the most interesting studies here are those that deal with equally effective treatments that vary markedly in the cost per pupil, for it is here that efficiency (in the shadow of scarcity) can provide the most useful information for decision makers. Each of the investigations, however, does provide insight into the elements and outcomes of the compensatory education efforts. Such relationships, as developed, contribute both to the knowledge and momentum when addressing the monumental task of replicating effective and efficient remedial activities for the educationally disadvantaged pupil who has demonstrated a lack of success in the absence of compensatory education.

Rochester Early Childhood Efforts

Given two approaches to meeting preschool objectives, as measured by the Caldwell Cooperative Preschool Inventory, a real difference may exist to favor the replication of one treatment over the other (effectiveness). If no real difference in the adjusted posttest means exists for the two target populations, efficiency (effectiveness in relation to cost) may be a reasonable consideration if replication of the treatments is proposed.

Background

The City of Rochester conducted two Prekindergarten approaches to address general school readiness under compensatory education resources. School readiness is hypothesized to be a prerequisite to later achievement in basic skills. One method, Operation Home Base (OHB), used target area homes as sites for readiness activities wherein home-school liaison personnel, paraprofessionals, and parents employed specifically prepared activity kits to teach selected skills to small groups of about eight pupils per home. The cost for the delivery of this approach amounted to approximately $1,320 per pupil. The second method utilized the conventional Early Childhood Readiness Center (ECRC), a centrally located facility with typical professional staffing, large pupil groups, and conventional readiness activities. This approach cost approximately $902 per pupil. The OHB activities served approximately 175 pupils, while the ECR centers treated 263 pupils. The district desired to know whether (1) pupils would demonstrate improvement as measured through the pretest and posttest administration of a standardized general readiness test regardless of which approach was employed, and (2) pupils in one approach would demonstrate greater achievement (growth) than the pupils in the other approach.

Procedure

The Caldwell Cooperative Preschool Inventory is a survey device that samples behaviors (knowledges and skills) of vocabulary, number concepts and ordination concepts of size, shape, motion, color, time object and class, as well as social functions. The device was administered in November, 1973 and April, 1974 to all pupils in both approaches present on the dates of testing. For the 114 OHB matched pairs of scores (pretest and posttest), the pupils averaged at the 54th percentile on the pretest and the 78th percentile on the posttest. The 196 ECRC pupils' average scores were at the 36th percentile on the pretest and the 68th percentile on the posttest. For each group, the separately computed t-ratio indicated that a real difference existed between the pretest mean and the posttest mean (significant at $p \leq .001$).[1] The data are presented in table 43.

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[1] All comparisons are made with the proposition addressed in the null hypothesis format.

Table 43

The Pre and Post Mean Percentiles on the Caldwell Cooperative Preschool Inventory

Activity	Total N	Sample N	Date	Pretest Mean	SD	Date	Posttest Mean	SD	t	Level of Significance
OHB	175	114	11/73	53.94	32.17	4/74	78.42	27.63	9.4413	p .001
ECR	263	196	11/73	36.38	27.44	4/74	68.06	25.80	21.0257	p .001

Source: Rochester Public Schools

Since the two groups demonstrated a pretest behavior at some distance from each other (the means and standard deviations were not identical), the district applied an analysis of covariance to remove initial differences for the subsequent comparison. The data in table 44 indicate that there were no gross differences in the groups' composition by sex and that the average age difference between groups was less than 2½ months. The F-ratio computed on the difference between the adjusted posttest means (and sum of squares) did not indicate a significant difference.

Table 44

Summary Statistics for an Analysis of Covariance Performed on the Results of Two Administrations of the Caldwell Cooperative Preschool Inventory

Activity	Sample N	Date	Pretest Mean %ile	SD	Mean Pre Age	Sex *	Date	Observed Posttest Mean %ile	SD	Adjusted Mean Post %ile	DF1	DF2	F	Level of Significance
OHB	114	11/73	53.94	32.21	3.93	.51	4/74	78.42	27.75	71.74	1	305	.0061	NS
ECR	196	11/73	36.38	27.51	4.24	.48	4/74	78.42	25.86	71.94				

* Sex 1 = male
2 = female

Source: Rochester Public Schools

Findings

1. A real difference between pretests and posttests was detected for each group in terms of growth across the treatment period on those measures surveyed by the Caldwell Cooperative Preschool Inventory. While the treatments cannot be said to have caused such growth, the movement in percentile ranks (in excess of 25 percentile point positions) lends itself to the inference that both supplementary activities were effective.

2. The results of the analysis of covariance indicate that one approach was no more effective than the other.

Interpretation

Either approach will probably bring about improvement in those readiness areas assessed by the Caldwell Cooperative Preschool Inventory. However, no evidence was presented to indicate that one approach was more effective than the other. Faced with this finding, education decision makers who are concerned with efficiency cannot defend the continuance of the OHB approach (which costs nearly 50 percent more per pupil than the ECRC approach) on the basis of test performance reflecting pupil achievement alone. The additional OHB cost per pupil may be considered a function of public relations, community involvement, or social engineering (where tax funds are redistributed directly in the ghetto community for payment to nonprofessionals indigenious to that community), but not as a cost necessary for change in pupil behavior. The study is being replicated during fiscal 1974-75 to determine whether the findings relative to efficiency are constant.

College Discovery in New York City

Do high school pupils who participated in a reduced size tax levy class and who received a Title I funded supplementary treatment demonstrate greater mathematics achievement than pupils who received the same supplementary treatment in support of a normal sized tax levy class experience?

Background

The College Discovery and Development Project attempted to increase the rate of achievement in reading and mathematics for educationally disadvantaged pupils in grades 10, 11, and 12. Tax levy classes generally consisted of approximately 30 pupils. In an extra session, Title I target pupils went to one of three centers for small group (15 pupils) instruction. In March, ESEA, Title I staff were added to some of the regular classrooms containing the target population in addition to the usual tax levy staff. Adjustments were made resulting in classes of not more than 20 pupils. The supplementary sessions continued. No time series evaluation designs were in force, although an immediate modification in the extent of data analysis was superimposed on the project.

Procedure

The district desired to know whether the supplementary instruction and the reduced class size was related to the pupils' performance in reading and/or mathematics. The scores of two groups of Title I target pupils were available for comparison: Group A received a regular tax levy program in a classroom of approximately 30 pupils plus the supplementary sessions at a center. In March, Group B experienced the reduced class size.

The district evaluators first analyzed the data to determine whether the reading and mathematics scores for either group improved at all between the pretest (October, 1973) and posttest (April, 1974) dates of administration of the California Achievement Test (combined subtest, reading) and Metropolitan Achievement Test (combined subtest, mathematics), respectively. Alternate forms of each device were administered in the two test occasions. A second analysis, via the simple linear regression described in Chapter VII, was conducted to determine whether the participants achieved more than would have been expected in the absence of the Title I services. A third analysis was conducted to determine whether a real difference existed between Group A's performance on the posttest and Group B's performance on the posttest. In the last technique, analysis of covariance was employed to adjust posttest group means to remove effects of the grade and pretest scores. The data displayed in table 45 indicates the pretest mean (in grade equivalent units), the predicted posttest mean, the actual posttest mean, the r-ratio value computed from the difference between the predicted and actual posttest scores, and the level of significance.

Table 45

College Discovery Achievement Data, 1973-74

Group	Subject	Test	Number of Matched Pairs Tested	Pre-test Mean	Predicted Post-test Mean	Actual Post-test Mean	Obtained Value of t	Level of Significance
A	Reading	CAT*	92	10.66	11.20	11.42	1.86	N.S.
B	Reading	CAT	446	9.21	9.71	10.34	10.52	$p \leq .001$
A	Mathematics	MAT**	90	8.05	8.50	8.56	.63	N.S.
B	Mathematics	MAT	154	8.12	8.58	9.02	7.16	$p \leq .001$

* California Achievement Test, Form A pretest, Form B posttest, level 4.

** Metropolitan Achievement Test, Form G pretest, Form H posttest, advanced Level.

In the six months interval between test administrations, Group A recorded an increase of 7.6 months in reading and 5.1 months in mathematics. During the same period Group B demonstrated an 11.3 month gain in reading and a 9.0 month gain in mathematics. In both subject matter areas, the difference between the predicted posttest mean and the actual posttest mean was found to be significant (a true difference from zero) at $p \leq .05$ or better for only Group B.

The pretest means, standard deviations, and adjusted posttest means (the covariates were grade and pretest scores) for the analysis of covariance may be found in table 46. The F-ratios were found to be signiicant at the criterion level set in both comparisons.

Table 46

Analyais of Covariance, College Discovery, 1973-74

Group	Subject	Test	Number Tested	Pretest Mean	Standard Deviation	Adjusted Posttest Mean	Standard Deviation	Obtained Value of F	Level of Significance
A	Reading	CAT	92	10.66	5.35	10.19	5.49	8.046	$p \leq .005$
B	Reading	CAT	446	9.21	4.76	10.59	5.34		
A	Mathematics	MAT	90	8.05	3.91	8.58	4.04	24.801	$p \leq .001$
B	Mathematics	MAT	154	8.12	3.96	9.01	3.47		

Interpretation

1. Both groups demonstrated growth in both subject matter areas.
2. In both reading and mathematics analyses, Group A (normal tax levy class size plus ESEA, Title I center activity) failed to demonstrate achievement beyond that expected in the absence of Title I intervention with supplementary activities.
3. In both reading and mathematics analyses, Group B (reduced size classes plus ESEA, Title I center activity) achieved more than was anticipated on the basis of the pupils' past record of growth.
4. The results of the analysis of covariance indicated a difference in the adjusted posttests. The difference may be inferred to be related to Group B's performance.

Implications

Previous studies (cf., More Effective Schools Studies, Psychological Corporation) indicated that a reduction in class size (from approximately 30 to 15 pupils) by itself did not appear to be related to accelerated achievement. Consequently, ESEA, Title I projects with solely that intent for reorganization have not been funded in recent years. However, when these pupils enjoyed smaller classes of twenty and received a supplementary treatment at a center, they out-performed other disadvantaged high school pupils from a regular sized class (30 pupils) who received the supplementary center reading and/or mathematics activities. A replication of this study, where a longer term of reduced class size in conjunction with the center activities, is recommended to determine if (1) the findings are confirmed and (2) the differences become more pronounced.

Syracuse Prekindergarten Approaches

The Syracuse school district inquired as to whether the average recorded change in Intelligence Quotients was related to the particular Syracuse Prekindergarten Approach.

Background

Syracuse conducted three types of Prekindergarten activities to better prepare three to five year old pupils for later academic success. The Peabody Picture Vocabulary test was administered before and after each treatment period. The district elected to report the mean pretest and posttest Intelligence Quotient[1] scores for the traditional approach, the Montessori Approach, and the mobile-home base approach. ESEA, Title I supports one traditional approach site and one Montessori approach site. The New York State Urban Education Program supported one Montessori site and the mobile-home base approach. After the pupils' eligibility was established by the district, the assignment of pupils to a treatment was determined through a conference with a parent or guardian. The evaluators asked the question: Are there differences between the posttest means for the three approaches?

Procedure

The three treatment groups were pretested with the Peabody Picture Vocabulary test in October, 1973 and posttested in May, 1974 with the alternate forms A and B, respectively. An analysis of covariance (ANCOVA) was imposed upon the data (which may be found in table 47) to adjust the posttest mean for initial differences (pretest means) in the three groups.

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[1] Changes in I.Q. scores are held to be highly sensitive to increased verbal capacities by some authorities. Other authorities suggest that the changes on tests for I.Q. are functions of reliability, not true growth.

Table 47

Syracuse Prekindergarten Data Analysis

Approach	Number of Matched Scores	Pretest		Obtained Posttest		Adjusted Posttest Mean
		Mean	S.D.	Mean	S.D.	
Traditional	47	76.59	18.89	81.94	19.24	86.62
Montessori	50	84.51	15.14	89.86	17.88	89.04
Mobile-Home Base	55	86.16	15.35	96.87	16.23	94.91

Source: Syracuse City School District

The F-ratio applied to the difference among the obtained posttest means (ANOVA) was found to be significant ($p \leq .01$).

The F-ratio applied to the difference among the adjusted posttest means (ANOVA) was found to be significant ($p \leq .05$).

Since it was found that there was a significant difference among the different treatments, the Scheffé method for determining which treatment comparisons yielded significant differences was applied to the data. The comparisons, obtained F's, and levels of significance are shown in table 48.

Table 48

Comparison of Syracuse Prekindergarten Treatments

Treatment Comparison	Obtained F	Significance*	
		p .05	p .01
Traditional vs. Montessori	4.897	no	no
Traditional vs. Mobile-Home Base	18.196	yes	yes
Montessori vs. Mobile-Home Base	4.147	no	no

*Scheffé method for isolating significant differences.

Interpretations

The mobile-home base approach appears to be equally as effective as the Montessori method in increasing the prekindergarteners' intelligence quotients as measured by the Peabody Picture Vocabulary Test. The same may also be said concerning the traditional approach when compared to the Montessori method. However, there is a significant difference in effectiveness between the mobile-home base approach and the traditional approach. The mobile-home approach appears to be superior to the traditional approach to prekindergarten.

Troy: Intensive Reading and Mathematics Skills

The average recorded change in grade equivalent scores in reading and mathematics may be related to the type of instructional approach.

Background

Troy conducted two types of Title I supported remedial instruction activities for pupils in grades 4-6 in reading and for pupils in grade 4 in mathematics. Students in the Intensive Reading and Mathematics Program met in groups of 15 for 3 hours daily, the time being divided approximately equally between reading and mathematics. Students in the Corrective Reading and Corrective Mathematics programs met in groups of 8 for one hour daily. Both public and nonpublic schools participated. The district reported grade equivalent scores on the Metropolitan Achievement Test for each pupil in the programs. All students who scores at or below the 23rd percentile were included in the analyses below. The evaluators asked the question: Are there differences between the posttest means for the two groups in either subject area?

Procedure

The Metropolitan Achievement Test, Elementary and Intermediate Levels, Form G was administered to both groups as a pretest in September, 1973. An alternate form of the same device was given to both groups as a post-test in May, 1974. An analysis of covariance (ANCOVA) was imposed on the data for each subject area (table 49) to adjust the posttest means for initial differences (pretest means) in the two groups.

For both reading and mathematics, the F-ratio applied to the difference between the adjusted posttest mean (ANCOVA) was found to be nonsignificant ($p \leq .05$).

Findings

In reading, although the pupils in the Intensive program gained three months more than those in the Corrective program (1.44 months gain vs. 1.14 months gain), the statistical analysis (ANCOVA) does not support the

Table 49

Troy Reading and Mathematics Data

Subject Area	Approach	Number of Matched Scores	Pretest		Obtained Posttest		Adjusted Posttest Mean
			Mean	S.D.	Mean	S.D.	
Reading	Intensified	60	2.67	.78	4.11	1.35	4.25
	Corrective	97	2.94	.70	4.08	1.19	3.99
Math	Intensified	20	2.75	.42	3.86	.89	4.01
	Corrective	18	2.97	.31	4.35	.60	4.18

assumption that one program is superior to the other. In mathematics, pupils in the Corrective program gained 2.7 months more than those in the Intensive program (1.38 months gain vs. 1.11 months gain)--the reverse of program in reading. However, again the statistical analysis (ANCOVA) does not support the assumption that one program is superior to the other.

New York City High School Family Liaison Program

The district desired to know whether pupils who received home-school liaison worker service in addition to supplementary reading instruction achieved more growth in reading than pupils who received only the supplementary remedial reading treatment?

Background

The Central Board of the City of New York sponsored a supplementary remedial reading program for eligible high school participants (grades 9 - 12). The district noted that in addition to educational disadvantagement, the target population generally demonstrated poor peer and family relationships, hostility toward authority figures, low aspiration, high truancy, etc. The family liaison program was designed to have family assistants (paraprofessionals) visit or contact parents with the intent of securing parental interest, concern, and motivation in supporting the school personnel's attempt to increase pupil achievement. There were insufficient funds to serve all pupils with the home-school contact effort implemented from February, 1974 to June, 1974, thereby making two groups available for comparison.

Procedure

Alternate forms of the combined reading sections of the Metropolitan Achievement Test were administered in February and May, 1974. Since the pupils were not randomly selected for the home-school contact effort, statistical controls were introduced in the analysis. The differences between the pretest and posttest grade equivalent means were in excess of five months for both populations. The data in table 50 indicate the number of pupils for which both a pretest and posttest were available, the means and standard deviations.

Table 50

High School Family Liaison Reading Data

Group	Test Level	Number Tested	Pretest		Posttest		Level of Significance
			Mean	S.D.	Mean	S.D.	
Remedial Reading Plus Family Liaison	Intermediate	451	4.27	1.23	4.77	1.29	None
Remedial Reading Only	Intermediate	328	4.32	1.33	4.84	1.42	
Remedial Reading Plus Family Liaison	Advanced	539	5.73	1.45	6.49	1.48	None
Remedial Reading Only		444	5.79	1.38	6.48	1.58	

Findings

1. Both groups administered the intermediate level recorded a change of over five (5) months between the pretest and posttest.

2. Both groups administered the advanced level demonstrated a seven (7) month change in reading achievement.

3. The F-ratio applied to the pretest means and standard deviation uncovered no real differences ($p \leq .05$).

4. The F-ratio applied to the posttest means and standard deviations uncovered no real differences ($p \leq .05$).

Interpretation

The supplementary remedial reading treatments may be inferred to be effective. The additional support by the home-school liaison paraprofessionals did not appear to be reflected in increased achievement. Since the treatment period was brief, the study might profitably be replicated. If the findings are confirmed over a longer period, an adjustment in the elements of the family liaison program would be in order.

Sensitivity of Norm-Referenced Measurement Devices Across Short Treatments

Test-retest administrations of norm-referenced tests may not yield useful information across intervals of short duration (a few weeks or less).

Background

In New York State, objective measures are required to be collected in all ESEA, Title I projects. A pretest at the outset and a posttest of the conclusion with an alternate form of the same device is usually administered. Typically, norm-referenced test scores in grade equivalent units have been reported. The use of norm-referenced tests for collecting measures across treatments spanning three months or less has been challenged as psychometrically unsound. Some reasons are:

1. The reliability of individual scores at the tails of a distribution is lower than for the larger portion of the whole group. Performance contractors once used this information to their advantage. Title I participants are selected from the lower tail of the distribution. In addition, for pupils not demonstrating a history of low test scores, a single low test score used both as a pretest and treatment selection screening score may be so unreliable that upon the posttest, the phenomenon called "regression to the mean" may be operating, rather than real change.

2. Treatments of short duration are constructed to address a few specific behavioral objectives of limited content magnitude. Norm-referenced tests are by design built to survey a large variety of content. Consequently, very few items in a norm-referenced test would be sensitive to the intervening instruction. Small amounts of behavioral change may not be reflected in the second administration of the norm-referenced test device. (Sensitivity to instruction).

The question raised by evaluators was: If regression effects due to pupil selection criterion could be controlled for score reliability, would a pretest followed by a posttest one month later yield data of a nature that would reflect a treatment's impact? Presumably, a positive difference would permit decision makers to determine whether treatment replication was reasonable. (Null Hypothesis: There will be no difference ($p \leq .05$) between the pretest and posttest means in reading comprehension obtained from a norm-referenced test administered four weeks apart).

Procedure

In district 18, New York City, 1,370 pupils in grades two through eight were selected for participation in a summer session remedial reading program. Each member of the target population demonstrated a combined reading score below the 23rd percentile on the Metropolitan Achievement Test administered in April, 1974.

On July 1 and 31, the target population was administered alternate forms of the appropriate levels of the Stanford Diagnostic Reading Test (1966) comprehension subtest. The means and standard deviations of the two test administrations are presented in table 51.

The district analyzed the difference between the means via a correlated t-ratio.

Table 51

Stanford Diagnostic Reading (Comprehension) Test Results, District 18
Pretest Form W on 7/1/74 - Posttest Form X on 7/31/74

Level	Grade (Entering)	Total Pupils	Pupils Tested	Pretest		Posttest		Correlated t-ratio Value
				Mean	S.D.	Mean	S.D.	
I	3	120	112	2.15	.57	2.25	.47	.28
I	4	240	231	2.48	.58	2.54	.49	.18
II	5	300	284	3.14	.86	3.37	.82	.68
II	6	210	208	3.76	1.03	3.98	.89	.41
II	7	200	184	4.51	1.66	4.45	1.28	.09
II	8	200	187	5.14	1.88	5.11	1.71	.03
II	9	100	90	4.93	2.02	4.91	1.73	.005

No difference was detected between the means at a reasonable level of confidence. Similar findings were isolated in other districts in New York City with other norm-referenced measurement devices.

Interpretation

1. Regression effects were not operating to effect a spurious change in means.
2. No real growth in pupil behavior related to comprehension skills occurred between the two test administrations.
3. If pupil behavioral change occurred, the change was not detected by this norm-referenced test.
4. The information provided may not be useful for decision makers.

Implications

Norm-referenced measurement devices may not be sufficiently sensitive to isolate behavioral change across short treatments intervals. If such is the case, there will be insufficient information upon which to base a decision for replication of the treatment.

The State may not be able to rely upon norm-referenced achievement data as the single indicator of success in short-term treatments. The use of standardized, leveled criterion referenced tests might be a reasonable alternative. A study of performance on selected criterion-referenced tests and norm-referenced tests over a longer term (along the lines of classical concurrent validity studies) may be appropriate with the intent of assessing the reliability of criterion referenced test measures. Alternatively, a program office policy that exempts districts conducting projects for small amounts of money from the assessment of behavioral change with norm referenced-tests across brief intervals may be reasonable.

Regression Effects

Regression effects on norm-referenced tests administered across short-treatments may occlude effects related to treatments.

Background

The review of the problems associated with interpreting norm-referenced achievement data when another device is used for participant selection is contained in the study immediately preceding. However, the problems are further compounded when the pretest serves as the participation selection device.

The Central Board of the City of New York conducted a summer high school program offering remedial reading and mathematics activities for pupils in grades nine through twelve. Attendance in summer projects is necessarily voluntary. The screening test score served as the pretest score. The pupils were tested with a norm-referenced achievement test close to the outset and conclusion of the activities. Evaluators asked the question: When the same device was used as a screening and pretest measure, did gains (in grade equivalents) appear so large that regression effects prevented meaningful interpretation of the data? The absence of meaningful interpretation would prevent the use of this source of input for decision making with regard to assessing the project's success. Furthermore, without an adjustment for the regression effect, the effort required in the measurement activity is of debatable value.

Procedure

Alternate forms of the Metropolitan Reading of Mathematics Tests (Advanced) level were administered on July 1 and August 7, 1974. An analysis was applied to the difference between pretest and posttest means via a correlated t-ratio. Among the 1586 pupils treated, 1535 provided matched pairs of reading scores for analysis. From the 1151 mathematics participants, 849 matched pairs of scores were available.

Table 52

N.Y.C. Metropolitan Achievement Test Results, Summer High Schools

Reading

Pretest Advanced Level Form F on July 3, 1974 -
Posttest Form G on August 7, 1974

Grade	Total Pupils	Pupils Tested	Pretest Mean g.e.	Posttest Mean g.e.	Mean Difference (Months)	Obtained Value of t	Level of Significance
8	62	53	6.1	6.7	6	3.13	.01
9	358	349	5.2	5.8	6	8.41	.01
10	347	339	5.9	6.6	7	8.30	.01
11	327	318	6.0	6.7	7	9.21	.01
12	492	476	6.0	6.7	7	9.94	.01

Mathematics

Pretest Advanced Level Form F on July 1, 1974 -
Posttest Form G on August 7, 1974

Grade	Total Pupils	Pupils Tested	Pretest Mean g.e.	Posttest Mean g.e.	Mean Difference (Months)	Obtained Value of t	Level of Significance
9-12	1151	849	6.2	7.6	14	32.50	.001

Differences between the pretest means and posttest means ranging from 6 to 14 months across the period of five weeks, were recorded.

Interpretation

1. Regression effects may be operating to effect a spurious change in means.

2. If pupil behavioral change occurred, the change was concealed by the magnitude of change from all sources of error.

3. The information provided may not be reliable and useful for decision makers.

Implications

Norm-referenced tests administered twice at times different from the norming dates may not yield reliable data. Based upon experience, few educators would be prepared to defend six to fourteen months achievement in five weeks attained by learners who hitherto achieved no more than five months growth in a ten-month period. The use of the same test score for both screening (eligibility) and a pretest in summer projects is certainly suspect, particularly when the participants are from a tail of the normative distribution. The usefulness of norm-referenced test data (without accompanying reliability data) is subject to question if such data are o be considered when deciding to replicate (refund) a project. Other options, including the use of criterion-referenced tests, described previously may be of greater feasibility when assessing growth across treatments of short duration.

Yonkers Reading Diagnostic Center

The district inquired as to whether disadvantaged learners who received the supplementary service plus the tutorial service attained greater reading achievement than disadvantaged learners who received only the supplementary services.

Background

The eligible disadvantaged learners in Yonkers Title I buildings received an individual prescription for a reading treatment following a diagnostic test. Each target school had a reading resource teacher who assisted in carrying out the prescription with the staff of the school. When pupils did not respond (improve), a graduate student in reading and/or learning disabilities was assigned to carry out the prescriptions with individual students on a five-day-a-week basis for 30 minutes per day. Special kits of materials were assembled to carry out the prescriptions. There were insufficient tutors to meet all the participants needs so the most needy were served first.

The evaluators desired to know whether the tutorial services overlayed upon the supplementary diagnostic/prescriptive service with the reading resource teacher was related to greater achievement than the supplementary services without the tutorial activity.

Procedure

Pupils receiving and not receiving the tutorial services were pretested in January and posttested in May with either the Metropolitan Achievement Test (comprehension and word recognition subtests) or the California Achievement Test (same subtests). Since the participants were not randomly assigned to the tutors, an analysis of covariance was applied to the data. The data for the subtests were analyzed separately by the district. The test means, standard deviations and F ratios are reported in table 53. Group A received the tutoring while group B did not.

Table 53

Yonker's Reading Diagnostic Center Achievement Data

Grade	Test[1]	Subtest[2]	Forms	Level	Group	Number Tested	Pretest		Posttest		F ratio	Level of Significance
							Mean	S.D.	Mean	S.D.		
3	MAT	Comp.	F	Prim II	A	27	1.86	.50	2.36	.44	2.16	N.S.[3]
					B	26	1.87	.53	2.16	.61		
3	MAT	Voc.	F	Prim II	A	27	2.19	.37	2.48	.33	6.71	$p \leq .05$
					B	26	2.22	.30	2.27	.37		
4	CAT	Comp.	A,B	III	A	35	2.21	.58	3.15	1.12	.33	N.S.
					B	35	2.17	.81	3.31	1.24		
4	CAT	Voc.	A,B	III	A	35	2.18	.91	3.39	.93	.68	N.S.
					B	35	1.99	.66	3.62	.98		
5	CAT	Comp.	A,B	III	A	29	2.51	.89	3.85	1.20	.04	N.S.
					B	30	2.91	.66	3.84	1.09		
5	CAT	Voc.	A,B	III	A	29	2.55	1.12	3.40	.99	.35	N.S.
						30	2.78	1.03	3.66	1.09		
6	MAT	Comp.	F	Int.	A	17	3.93	.71	4.69	.78	.15	N.S.
					B	17	4.37	1.12	4.77	.85		
6	MAT	Voc.	F	Int.	A	17	4.11	.86	4.39	.91	1.33	N.S.
					B	17	4.44	1.13	4.89	.99		

Source: Yonkers Public Schools

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[1] M.A.T. = Metropolitan Achievement Test
C.A.T. = California Achievement Test

[2] Comp. = Comprehension Subtest
Voc. = Word Knowledge or Vocabulary Subtest

[3] N.S. = Not significant at $p \leq .05$

By subtracting the pretest mean from posttest mean, the change in grade equivalent units indicated that in 15 of the 16 comparisons (Group B, grade 3 vocabulary being the exception) achievement exceeded .7 month for each month between tests.

Findings

1. Progress (achievement) was indicated for both groups of pupils receiving ESEA, Title I supplementary services.
2. Among the eight comparisons conducted via the ANCOVA technique only one was found to indicate a significant difference ($p \leq .05$) between the adjusted posttest means.

Interpretation

The evaluators question must be answered in the negative for seven of the eight comparisons of subtest achievement. The tutorial effort cannot be said to have brought about greater increments in achievement than the supplementary service in the absence of tutoring. A replication of this study spanning a full treatment session (10 months) might be of value if a question of duration of treatment is a consideration. This study spanned only the period from January to May, 1974.

Review

The eight studies published here were conducted with the participation by local districts who were committed to better education for the disadvantaged learner. The districts were willing to expose failures as well as successes in an effort to bring about greater academic growth. Other districts (like Syracuse) with demonstrated effective treatments constantly search for both effective and less expensive activities that will help educationally disadvantaged Title I participants achieve. In addition, the quest for measures that will yield reliable and valid data for clear interpretation leading to useful decision making input continues in the field of education evaluation. Together, these studies reveal a small part of the activities of school people at all levels who are working diligently to arrest and reverse the trend toward the deprivation in the area of academic achievement on the part of ESEA, Title I participants in New York State.

APPENDIX A:

Local Education Agencies that Failed to File an Official Report of Project Effectiveness, 1973-74

Table 54

Regular School Session

Project Name	Project Number	Amount
Berkshire Farm	10-03-08-74-001	$ 3,500
Berkshire Farm	10-03-08-74-002	$ 53,111
Grand Gorge	12-15-01-74-002	$ 8,605
Rhinecliff	13-18-02-74-001	$ 9,400
Fairport	26-13-01-74-001	$ 42,125
St. Johnsville	27-11-02-74-001	$ 22,870
Waterville	41-19-01-74-001	$ 31,303 */
Warwick Valley	44-21-01-74-001	$ 23,000
Holley	45-07-04-74-002	$ 12,097
Morristown	51-21-01-74-001	$ 22,000
Quogue	58-09-03-74-002	$ 9,948
West Park	62-02-02-74-001	$ 16,556
SUB-TOTAL:		$251,315

*/This total includes $26,680 carry-over funds from FY 1973.

Table 55

Summer School Session

Project Name	Project Number	Amount
Port Byron	05-11-01-74-001	$ 9,007
Brocton	06-23-01-74-001	$ 9,590
Norwich	08-12-00-74-001	$ 17,940
Beekmantown	09-03-01-74-001	$ 2,399
Roxbury	12-15-02-74-001	$ 2,706
Moriah	15-09-01-74-002	$ 38,371
Cazenovia	25-02-01-74-002	$ 10,241
De Ruyter	25-03-01-74-002	$ 19,122
Gates-Chili	26-04-01-74-001	$ 5,226
Levittown	28-02-05-74-001	$ 39,750
Bellmore-Merrick	28-02-53-74-001	$ 20,330
Locus Valley	28-05-03-74-001	$ 2,689
Fabius-Pompey	42-06-01-74-001	$ 8,943
Tully	42-19-02-74-001	$ 6,266
Phelps-Clifton Springs	43-13-01-74-001	$ 39,000
Central Square	46-08-01-74-001	$ 25,090
Mexico	46-09-01-74-001	$ 5,216
Milford	47-11-01-74-001	$ 5,169
Comsewogue	58-02-03-74-001	$ 33,200
Middle Island	58-02-12-74-001	$ 28,962
Hauppauge	58-05-06-74-001	$ 13,842
Connetquot	58-05-07-74-001	$ 5,388
Central Islip	58-05-13-74-002	$ 57,255
Eastport	58-09-11-74-001	$ 3,000
Southhold	58-10-05-74-001	$ 14,859
Fallsburg	59-05-01-74-001	$ 9,950
Monticello	59-14-01-74-001	$ 21,813
Trumansburg	61-10-01-74-001	$ 3,500
Tuckahoe	66-03-02-74-001	$ 6,724
Graham Home	66-04-10-74-001	$ 5,444
Mamaroneck	66-07-01-74-001	$ 9,000
NEW YORK CITY:		
District 16	33-16-00-74-051	
	51603	$ 261,932
	51604	$ 209,120
District 5:	31-05-00-74-074	
	51603	$ 136,698
	51604	$ 122,033
Sub-Total:		$1,209,775

Achievement data from 45 projects (5 percent) amounting to $1,461,090 is not included in this report.

APPENDIX B

Projects with Promising Activities

The apparent phenomenal growth of educationally disadvantaged youngsters in some project activities is a signal to decision makers. Remedial treatments wherein student achievement occurred and reasonable costs were associated with the facilities, staff, materials, etc. are often cited as promising activities for transplanting to other similar situations (ease of replication).

In New York State the search for such activities in compensatory education projects involves checking pupil achievement against several standards. The process of isolating promising activities involves the following:

1. The pupils must have been selected for the treatment on a score taken at a different time from when the pretest score was obtained. This phase of needs assessment eliminates the fallacy of achievement associated with the regression to the mean evident at the tails of a distribution.

2. The activities selected for citation must be in districts that have comparable districts elsewhere in the State. Since the largest part of New York State's ESEA, Title I monies are directed toward large urban districts, the isolation of promising treatments that are large in cost but with reasonable per pupil expenditures are particularly attractive. Large groups permit greater confidence when interpreting results and remove the likelihood of encountering results influenced by one extraordinary teacher or similar non-representative treatment factors. However, many smaller upstate districts contain comparable learners and demonstrated promising activities also reported here.

3. Measures of effectiveness must be both statistically and educationally significant. That is, true differences in means must be established and the magnitude of the growth (impact) may be intuitively recognized as substantial.

4. The individual pupil performance prior to entering the activities must be estimated as well as the performance across the supplementary activities. This is commonly accomplished by the use of a simple linear regression wherein a monthly rate of gain prior to treatment is derived from the pretest and the product of this increment times the number of months of supplementary treatment is added to the pretest in an effort to estimate the posttest in the absence of the treatment. The pupils posttest obtained from testing is compared to the estimated posttest and the differences are tested by means of a correlated t-ratio.

5. The projects must contain specific performance objectives in either reading or mathematics achievement.

The promising activities selected for this report met the conditions cited above. For interpretation, the growth or data points are presented in grade equivalent units and the technical objectives were paraphrased as goals. The pupils generally achieved one month growth or better for each month of the supplementary activity in either reading or mathematics.

Title of Project: Corrective Reading Grades 7-9

Location: Carthage

Budget: $19,601

Cost/Participant: $436 Participants: 45

Major Goal:

Among the pupils, who were all selected on the basis of scoring at least two years below grade level on a standardized reading test in May, 1973, fifty percent would gain at least ten months, thirty percent would gain from six months to 10 months, while the remainder would gain at least six months as measured by the Gates-MacGinitie Reading Test.

Activities:

During the eighty (80) hours supplementary reading instruction, the corrective reading teacher prepared individual prescriptions for skill remediation, instructed disadvantaged learners as well as coordinated support activities with the regular classroom teacher.

Findings:

Thirty-nine pupils pretested in September, 1973 and posttested in June, 1974 achieved 16 months across the same period wherein the pupils were expected to achieve just 4 months based upon their past rate of growth.

Title of Project: Strengthened Basic Skills Grades: 2 and 3

Location: New York City, District 24

Budget: $334,224

Cost/Participant: $422 Participants: 792

Major Goal:

The participants were expected to achieve a significantly greater rate of growth in reading and/or mathematics each month than was expected on the basis of their past performance as measured by the Metropolitan Achievement Tests.

Activities:

The supplementary services of 450 hours in reading and 150 hours in mathematics involved a diagnostic approach leading to individual prescriptions for remediation of selected skill. The support staff of 39 paraprofessionals supervised the use of programmed mathematics, reading and language laboratory materials.

Findings:

Two hundred thirty-seven (237) participants in the second grade reading Distar treatment achieved 8 months growth (grade equivalent units) in seven months between pretest and posttest administrations of the Metropolitan Achievement Test. One hundred eighty-eight (188) third grade participants achieved over 7 months growth in the same interval. This growth exceeded the expected growth (in the absence of ESEA, Title I supplementary activities) by over three months.

In mathematics, 228 second grade pupils achieved 9 months and 183 third grade pupils achieved 10 months growth in the seven-month period between pre-and posttest administration of the Metropolitan Achievement Test. This was nearly six months growth over and above that which was expected in the absence of Title I services.

Title of Project: Remedial Reading	Grade: 4
Location: West Babylon	
Budget: $18,876	
Cost/Participant: $484	Participants: 39

Major Goal:

The students were to demonstrate achievement in reading that was one-half year beyond expectation (based upon past performance) as measured by the Durrell Analysis Reading Test.

Activities:

Individual pupils received a diagnostic profile and were instructed in small groups where needs were identified. The focus of instruction in the 72 hours of supplementary services included special work on study skill techniques, manipulation of ideas and comprehension skills.

Findings:

The pupils achieved 10 month growth (in grade equivalent units) between the pretest (September) and posttest (May) administrations of the primary level, forms D or E of the Durrell Analysis. The pupils were expected to achieve no more than 2 months during that same period.

Title of Project: Remedial Reading Grades: 7 and 8
Location: West Islip
Budget: $51,934
Cost/Participant: $281 Participants: 125 Public, 60 Nonpublic

Major Goal:

Reading speed, accuracy, vocabulary and comprehension were to improve equal to or more than a statistically predicted gain as measured by the Gates-MacGinitie Reading Test. The predicted posttest scores were to be compared with the actual posttest scores by the correlated t-ratio to determine significance.

Activities:

During the 100 hours of supplementary instruction the participating students were given informal reading surveys to identify and diagnose specific reading problems. Prescriptive, individualized programs based on the diagnostic results were developed and implemented by the corrective reading teachers.

Findings:

One hundred eighteen (118) public school pupils in grade 7 and 57 nonpublic school pupils in grade 8 were pretested in September and posttested in May, 1974. The grade equivalent gains achieved by the seventh grade pupils were anticipated to be 7 months, 6 months, 7 months, and 6 months in speed, accuracy, vocabulary and comprehension respectively, across the 8-month period. The pupils actually achieved 25 months, 25 months, 16 months and 11 months. Similar results occurred for the eighth grade pupils as shown below.

Grade	Subtest	Pretest Mean	Predicted Posttest Mean	Posttest Mean	Value of t	Significance
7	Speed	4.6	5.3	7.1	2.60	p .01
	Accuracy	4.4	5.0	6.9	2.00	p .05
	Vocabulary	5.1	5.8	6.7	5.37	p .001
	Comprehension	4.5	5.1	6.6	2.78	p .01
8	Speed	5.8	6.5	8.3	7.20	p .001
	Accuracy	5.7	6.4	7.6	5.27	p .001
	Vocabulary	6.2	7.0	7.2	3.14	p .01
	Comprehension	5.4	6.0	7.2	4.837	p .001

Title of Project: S.E.E.D. (Reading) Grades: 3,4,5

Location: Oneonta

Budget: $30,946

Cost/Participant: $260 Participants: 119

Major Goal:

The target population would significantly improve reading skills measured by the California Achievement Test. Significantly is defined as demonstrating a predicted posttest that was higher than a posttest predicted on the basis of past achievement.

Activities:

The pupils received 60 hours of small group (less than 6 pupils) instruction on individually prescribed objectives in the skill areas of perception (auditory, visual, motor), word identification (sight vocabulary, phonic analysis, structural analysis, clue, syllabication); comprehension, oral reading, study skills (organization, library, interpretation) as well as interpretation.

Findings:

Ninty-seven pupils who were selected on the basis of low performance on the Slosson Test or Durrell Analysis in grades three, four and five were pretested in September, 1973 and posttested in May, 1974 with the California Achievement Test in reading. The grade 3 target population which was expected to achieve 4.7 months in the 8-month period actually achieved a gain of 11.5 months in grade equivalent units. Grade 4 participants, who were expected to achieve 4.6 months actually achieved 13 months. Grade 5 participants who were expected to achieve 4.2 months achieved 12.2 months in grade equivalent units.

Title of Project: Elementary Reading Assistance Grades: 2 - 6

Location: Syracuse

Budget: $597,051

Cost/Participant: $426 Participants: 1,400

Major Goal:

For pupils determined to be one or more years behind grade level, the target population would demonstrate growth beyond expectation in vocabulary and comprehension skills as measured by the California Achievement Test.

Activities:

The 100 hour per pupil supplement in instruction took the form of tutorials and small group activities conducted by aides. The most frequent areas of instruction included phonics, structural analysis, comprehension and vocabulary development.

Findings:

The 1,187 pupils for whom both pretest and posttest scores were available averaged 8 months growth in the 7-month period between tests. The table below indicates that based upon historical growth rates, the target groups were expected to achieve about 4.5 months during that same period.

Grade	Subtest	Pretest Mean	Predicted Posttest Mean	Actual Posttest Mean	Value of t	Level of Significance
2 + 3	Vocabulary	1.66	2.11	2.51	11.13	p .001
	Comprehension	1.65	2.10	2.39	5.61	p .001
4 - 6	Vocabulary	2.66	3.11	3.47	9.93	p .001
	Comprehension	2.84	3.31	3.62	7.21	p .001

Title of Project: Reading Grades: 7-9

Location: Jamestown

Budget: $65,761

Cost/Participant: $255 Participants: 258

Major Goal:

The district proposed that at least 50 percent of the target population would achieve growth in reading beyond that which would have occurred in the regular classroom as measured by the Gates-MacGinitie Test (Level D).

Activities:

One hundred fifty hours of highly programmed instruction (Learning 100 System) provided a four part cycle of sequence for remediation. Pupils were systematically exposed to activities designed to promote perceptual accuracy and efficiency, skill building in word attack and comprehension skills and applications during independent reading.

Findings:

Two hundred thirty-four (234) pupils for whom both pretest and posttest Gates-MacGinitie scores were available (who also had been selected upon the basis of a low performance on the Iowa Test of Basic Skills the previous spring) were expected to achieve five and a half months growth in vocabulary and four months growth in comprehension across the nine month interval between tests. The target population achieved over twenty months in vocabulary skills and eighteen months in comprehension skills.

Title of Project: Passport to Learning	Grades: 2-6
Location: Watertown	
Budget: $132,081	
Cost/Participant: $367	Participants: 361

Major Goal:

The students, all of whom were selected on the basis of placing one or more years below grade level on the Spring Iowa Test of Basic Skills, were to achieve two months beyond that which was expected in the ten-month period (school year) as measured by the Gates-MacGinitie Reading Test.

Activities:

Individual Diagnostic Testing was carried out by a corrective reading specialist, the resulting prescriptions were implemented in "open" classrooms by the classroom teachers and/or assistants. The individual pupils received an average of 80 hours supplementary instruction.

Findings:

Prior to treatments sponsored by ESEA, Title I, the 361 pupils in grades 2-6 achieved .6 month for each month of regular classroom instruction. During ESEA, Title I activities, the participants averaged 1.35 months growth for each month of instruction. In other words, the target population recovered three months of prior losses as well as achieving the nine months growth in the nine months between pre-and posttest administrations of the Gates-MacGinitie Reading Tests.

Title of Project: Remedial Reading	Grades: 2,3
Location: Malone	
Budget: $60,795	
Cost/Participant: $298	Participants: 204

Major Goal:

Each participant was expected to achieve significantly more than the four months growth in reading anticipated on the basis of the pupils' past performance as measured by the Stanford Reading Test.

Activities:

During the 105-hour supplementary treatment, pupils in small groups were instructed in skills of sight word analysis, comprehension, study skills, and silent reading. Some participants received training in visual and auditory perception skills, awareness of configuration, as well as training in classification and sequencing.

Findings:

The grade two participants, who were expected to achieve 3 months growth in vocabulary and 2½ months growth in comprehension during the 8-month period between the pretest and posttest administration, actually achieved over 10 months in vocabulary and 8 months in comprehension. During the same period, the third grade participants who were expected to achieve 4½ months and 4 months in vocabulary and comprehension, respectively, actually achieved 8½ months in vocabulary and 8 months in comprehension.

Title of Project: Diagnostic/Remedial Mathematics Program
Grades: 3-9

Location: District 18, Brooklyn

Budget: $280,443

Cost/Participant: $286
Participants: 980

Major Goal:

The student participants in the Diagnostic/Remedial Mathematics project were to demonstrate increased acquisition of mathematics concepts and computation skills as assessed by the pre and post administration of the Stanford Diagnostic Arithmetic Test. The rates of growth across the treatment period were to exceed the pupils rates of growth prior to the supplementary treatment.

Activities:

The pupils received a 200 hour supplement treatment at diagnostic and remedial centers. Prescribed activities carried out in small groups and individually by a mathematics specialist supported by two paraprofessionals involved a heavy emphasis on programmed workbooks and manipulative materials. Small units of curriculum were tied to specific topics and objectives that were sequenced in a spiral approach within a hierarchy. The short units permitted accomplishment of objectives in brief period so that students were aware of their progress quickly and continuously.

Findings:

The participants were pretested in November, 1973 and posttested in May, 1974. The pretreatment rates of gain approximated one-half (.5) month for each month in the regular classroom. During treatment, however, the target population averaged achievement in excess of one-month for each month in the supplementary activities.

Title of Project: Elementary Corrective Reading	Grades: 2-6
Location: Syracuse	
Budget: $63,174	
Cost/Participant: $418	Participants: 151

Major Goal:

At the conclusion of 8 months of supplementary reading instruction, 55 percent of the pupils will achieve 5 months grade equivalent growth or better in reading comprehension and vocabulary as measured by the California Achievement Test.

Activities:

The participants received 150 hours of small group instruction when appropriate in phonics, structural analysis, auditory and visual discrimination skills as well as vocabulary development.

Findings:

For grades 2 and 3, the target population, which was expected to achieve $5\frac{1}{2}$ months in vocabulary and $4\frac{1}{2}$ months in comprehension during the 7-month period between tests, actually achieved almost 10 months in vocabulary and $7\frac{1}{2}$ months in comprehension as measured by the California Achievement Test.

Similarly, in grades 4-6, while the participants were expected to achieve 6 months in both vocabulary and comprehension, the group actually achieved a gain of 8 months in the former subtest and 11 months in the latter subtest.

APPENDIX C

Reading Achievement Data for Successful Ineligible Public and Nonpublic School Participants in Long Duration Treatments

Table 56

Reading Achievement in Grade Equivalent Units Across Grades One through Twelve for Successful Ineligible Public School Participants in Treatments Lasting Over Three Months in Fiscal Year 1973-74

Grade Interval	Participants		Rate in Months/Month During Treatment
	Treated	Tested	
1-3	2,501	2,130	1.43
4-6	897	856	1.61
7-9	547	523	2.42
10-12	3,267	1,980	1.56
TOTAL	7,212	5,489	

Table 57

Reading Achievement in Grade Equivalent Units Across Grades One through Six for Successful Ineligible Nonpublic School Participants in Treatments Lasting Over Three Months in Fiscal Year 1973-74

Grade Interval	Participants		Rate in Months/Month During Treatment
	Treated	Tested	
1-3	311	287	1.45
4-6	392	379	1.84
TOTAL	703	666	

APPENDIX D

Reading Achievement Data for Unsuccessful Title I Participants in Long Duration Treatments

Table 58

Summary of Unsuccessful Eligible Participants in Reading Treatments Lasting Over Three Months in Fiscal Year 1973-74

	Grade Interval	Participants	
		Treated	Tested
Public	1-3	39,027	11,598
	4-6	18,632	14,637
	7-9	8,644	6,091
	10-12	4,547	2,320
Nonpublic	1-3	775	611
	4-6	1,902	1,258
	7-9	436	300
	10-12	123	65
TOTAL		74,086	36,880

Table 59

Summary of Unsuccessful Ineligible Participants in Reading Treatments Lasting Over Three Months in Fiscal Year 1973-74

Support Source	Grade Interval	Participants	
		Treated	Tested
Public	1-3	5,475	4,042
	4-6	3,780	2,571
	7-9	344	173
	10-12	45	32
Nonpublic	1-3	419	336
	4-6	170	167
	7-9	28	28
TOTAL		10,261	7,349

APPENDIX E

Reading Achievement Data for Successful Participants in Short Duration Treatments

Table 60

Reading Achievement Data From Short Duration Projects Where Eligible Participants Achieved the Objectives

School Type	Grade	Treated	Tested
Public	1-3	5,767	4,534
	4-6	8,927	6,857
	7-9	6,327	5,096
	10-12	8,644	4,962
	Subtotal	29,665	21,449
Nonpublic	1-3	--	--
	4-6	167	112
	7-9	116	116
	10-12	33	33
	Subtotal	316	261
TOTAL		29,981	21,710

Table 61

Reading Achievement from Short Duration Projects Where Ineligible Participants Achieved the Objective

School Type	Grade	Treated	Tested
Public	1-3	1,147	779
	4-6	861	777
	7-9	48	20
TOTAL		2,056	1,576

APPENDIX F

Reading Achievement Data for Unsuccessful Title I Participants in Short Duration Treatments

Table 62

Reading Achievement Data from Short Duration Projects Where Eligible Participants Failed the Objectives

School Type	Grade	Treated	Tested
Public	1-3	2,942	2,385
	4-6	3,732	2,731
	7-9	3,278	2,083
	10-12	538	264
	Subtotal	10,490	7,463
Nonpublic	1-3	97	50
	4-6	53	12
	7-9	119	59
	10-12	35	18
	Subtotal	304	139
TOTAL		10,794	7,602

Table 63

Reading Achievement From Short Duration Projects Where Ineligible Participants Failed the Objective

School Type	Grade	Treated	Tested
Public	1-3	2,946	1,557
	4-6	2,768	1,393
	Subtotal	5,714	2,950
Nonpublic	1-3	34	34
	4-6	31	31
	Subtotal	65	65
TOTAL		5,779	3,015

APPENDIX G

Mathematics Achievement Data for Unsuccessful Participants in Long Duration Treatments

Table 64

Eligible Participants in Mathematics Treatments Lasting More Than Three Months Where the Objectives were Failed

School Type	Grade	Treated	Tested
Public	1-3	3,781	2,280
	4-6	4,008	2,697
	7-9	4,649	3,104
	10-12	5,427	2,874
	Subtotal	17,865	10,955
Nonpublic	1-3	224	177
	4-6	327	208
	Subtotal	551	385
TOTAL		19,416	11,340

Table 65

Ineligible Participants In Mathematics Treatments Lasting More Than Three Months Where the Objectives were Failed

School Type	Grade	Treated	Tested
Public	1-3	2,930	1,642
	4-6	1,460	877
	7-9	191	143
	Subtotal	4,581	2,662
Nonpublic	1-3	153	133
	4-6	62	25
	Subtotal	215	158
TOTAL		4,796	2,820

APPENDIX H

Mathematics Achievement Data for Unsuccessful Participants in Short Duration Treatments

Table 66

Eligible Participants in Short Duration Mathematics Treatments Whose Means Indicated That the Objectives were Failed

School Type	Grade	Treated	Tested
Public	1-3	1,283	259
	4-6	2,005	1,412
	7-9	1,717	568
	10-12	206	98
	Subtotal	5,211	2,337
Nonpublic	4-6	163	22
	7-9	142	99
	10-12	35	18
	Subtotal	340	139
TOTAL		5,551	2,476

Table 67

Ineligible Public School Participants in Short Duration Mathematics Treatments Whose Means Indicated That The Objectives Were Failed

School Type	Grade Interval	Treated	Tested
Public	1-3	2,152	966
	4-6	2,192	1,007
	7-9	51	51
TOTAL		4,395	2,024

APPENDIX I

Mathematics Achievement Data for Successful Participants in Short Duration Treatments

Table 68

Eligible Mathematics Participants Whose Means Indicated Objectives Were Met in Less Than Three Months Between Pretest and Posttest Administrations

School Type	Grade Interval	Treated	Tested
Public	1-3	10,903	5,584
	4-6	7,604	6,091
	7-9	6,528	4,432
	10-12	4,113	2,685
	Subtotal	29,148	18,792
Nonpublic	7-9	94	78
TOTAL		29,242	18,870

Table 69

Ineligible Public School Mathematics Participants Whose Means Indicated The Objectives Were Met in Projects of Short Duration

School Type	Grade Interval	Treated	Tested
Public	1-3	1,324	699
	4-6	974	887
	7-9	28	27
TOTAL		2,326	1,613